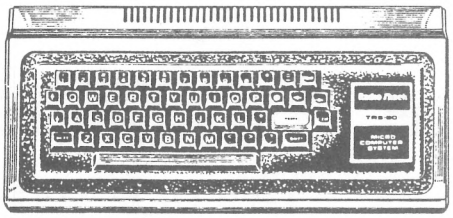
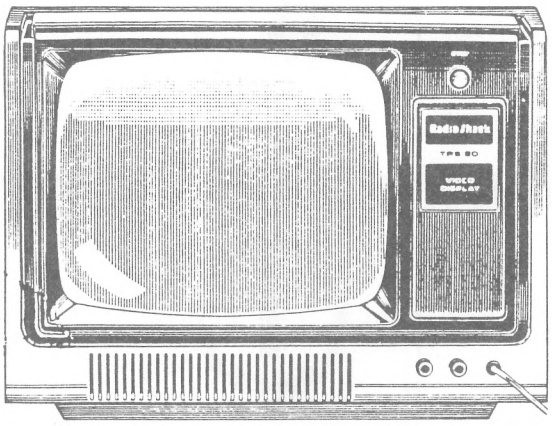
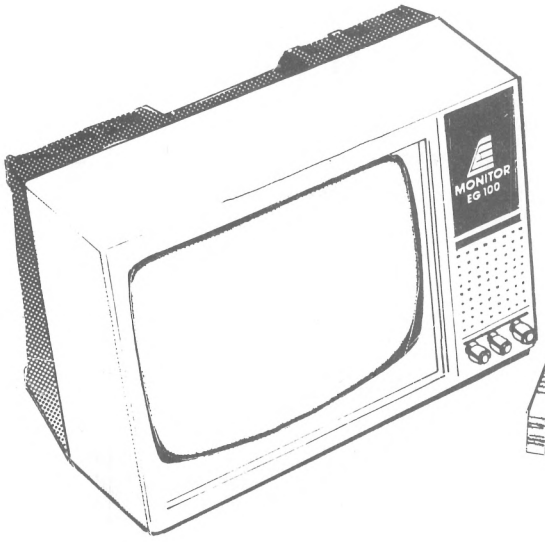
TRS-80 AND GENIE SOFTWARE

From HARDING'S - the TRS-80/Genie software people!







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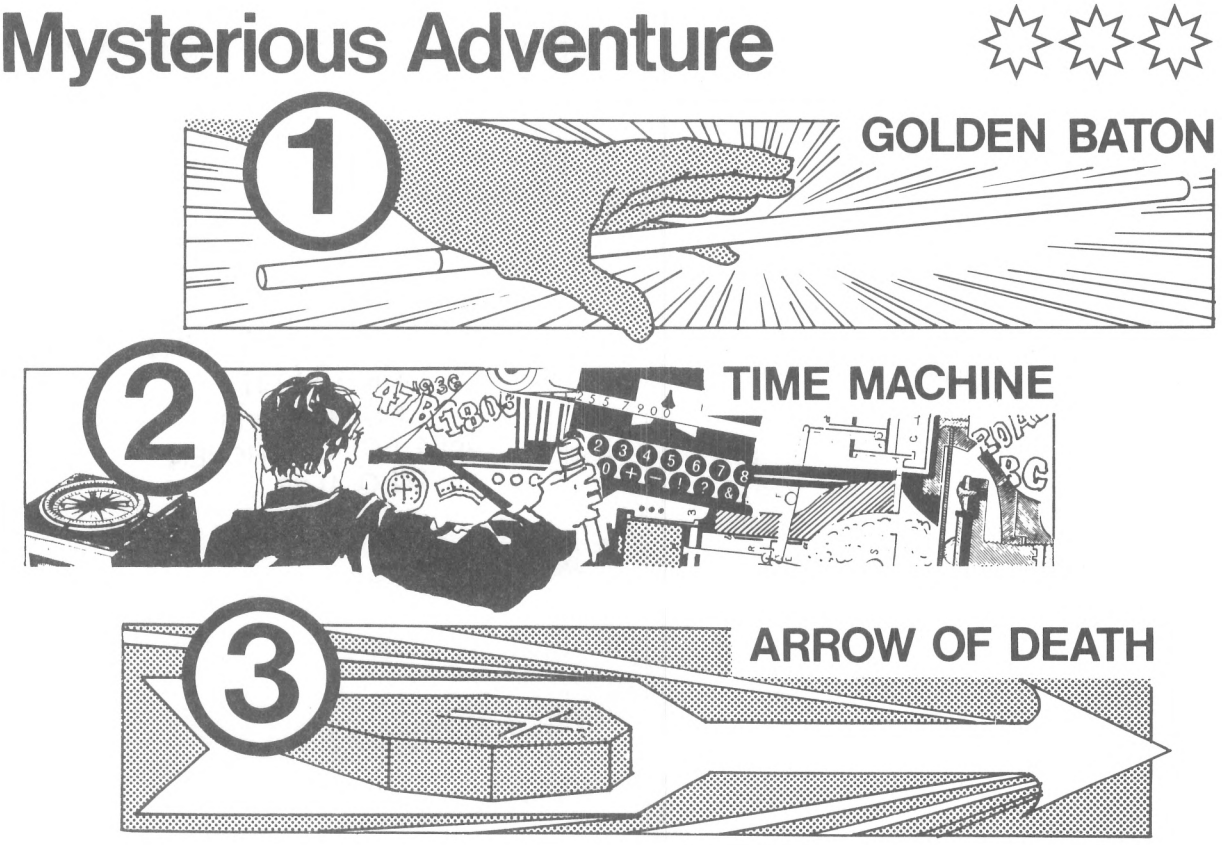
A Note on this Catalogue

This typeset catalogue is replacing our earlier catalogue which was printed from original typewritten artwork. The purpose of the change is to be able to fit in more copy and also to make the readability of the copy greater. Newcomers to the catalogue, however, should be advised, if they are to follow the format of the catalogue, that it is built up over the years by the addition, every eight weeks or so, of several new pages. When this occurs, the customer is sent the new pages plus a new index and price list. At the same time he is asked to discard the previous index and price list. Essentially, therefore, the catalogue is a compendium of additions. When reprinting it we had to decide whether or not to leave the catalogue in the condition described or to amalgamate all the information. We decided to take a middle course. Where appropriate, later additions to programs have been added to earlier versions so as to make the information more readily digestible. Where, however, this amalgamation has not been necessary, it has not been carried out so that the historical content is, to some extent, maintained. This is particularly true of the "Hints and Tips". One final point on the make-up of this publication. Occasionally a product will be discontinued. When this occurs it will be deleted from the index, hence if a description appears in the body of the catalogue, but not in the index, then it may be taken as discontinued. In other words, the current index is definitive as to whether or not an item is stocked.

Mysterious Adventure



Mysterious Adventure is a brand new Adventure series written by the English author Brian Howarth. The feedback that we have had from customers is that, particularly so far as the third Mysterious Adventure is concerned, the quality is far better than the well known Scott Adams series. At the moment the series consists of four Mysterious Adventures, The Golden Baton, The Time Machine and Part 1 and Part 2 of the Arrow of Death. To give you a preview, the additional Adventures planned for 1982 are:

Escape from Pulsar 7
Circus
Perseus and Andromeda
Waxworks
The Ghost of Mars
Ten Little Indians
Beyond the Infinite
After the Fire

All the Mysterious Adventures are written in machine code and are therefore very fast. Lower case from the third Mysterious Adventure on is fully supported and the full 16K is used for Adventure itself. Instructions and synopsis sheets are supplied separately. We are proud to be able to introduce a truly English written Adventure series which is in all ways compatible, and in many ways superior to American products. Indeed it is indicative of this superiority that the Mysterious Adventure is now published in the United States, as are a number of our other programs. Although each Adventure differs, it may be useful to know that the ARROW OF Death (Part 1), for instance, contains 60 objects to manipulate and approximately 30 problems or puzzles to solve. Write ups on the new Mysterious Adventures as they become available will, of course, be mentioned from time to time in additions to this catalogue.

FILE AND DATA HANDLING FOR DISKS

A file and data handling program unlimited in applications in that it incorporates a high degree of user architecture. It is similar in many ways to our Mailing List but the user decides what headings the date is to be filed under together with other program parameters. File handling capabilities include adding or amending entries, display entries on the VDU or print to a line printer, searching for specific entries and displaying or printing all relevant data, searching the files when only partial information is available, print and display the entire file. Any number of entries may be filed with only one disk drive, although two drives add speed and ease of manipulation. Entry sorting is not supported at this time due to the slowness of Basic in handling large numbers of entries. A machine code sort is in hand at the moment, which will be compatible with this program and capable of being added to it. We will update the programs of present purchasers for the sort feature when it becomes available at a nominal handling and recording charge.

MONITORS 3 AND 4

Monitors 3 and 4 by Hubert S: Howe are probably the best available for the TRS-80 and Genie microcomputers. They are wide ranging in features and come with a well written manual of approximately 32 pages. Although the two Monitors are, to some extent, interchangeable, the intent is that Monitor 3 should be primarily for tape users and Monitor 4 for disk users. It would be inadvisable for a tape user to purchase Monitor 4 because a number of the functions would not be usable. Tape users who have purchased Monitor 3 may upgrade to Monitor 4 for the difference in price only. Both Monitors are compatible with the Model III TRS-80. Monitor 3 is supplied on 500 baud tape regardless of the model upon which it is to be used. Although Monitors are intended primarily to assist machine language programming, they contain a number of commands which are of considerable help to all computer users. Generally speaking, a monitor interacts with the computer at memory address level. When a Basic program, or anything else for that matter, is loaded into the computer it is stored in different memory locations. With the exception of the Basic Peek and Poke commands, the Basic programmer does not have access to the actual memory addresses. A monitor gives him this access, which frequently can be very advantageous. Furthermore the ability to actually look into memory and see what is going on, should be of interest to all serious computer users.
The commands available in the Monitors are as follows. Those marked with an * are available only in Monitor 4.

ASCII dump of memory block
Return to Basic or TRSDOS
Create Object Program File on disk*
Disassemble memory block
Edit memory
Find a specified byte
Hexadecimal dump of memory block
Input disk sectors*
Jump to a specified address
Kill a disk file*
Load a cassette machine language program
Move a memory block
Read a disk file to memory*
Output disk sectors*
Punch out a machine language tape
Write a disk file*
Relocate a program from one section of memory to another
Manufacture a symbolic tape (Monitor 3) or disk file (Monitor 4)
Type ASCII characters direct into memory
Unload the program below 5200*
Verify a memory block
Find a word
Execute hexadecimal arithmetic
Zero a memory block
Set baud for RS232C interface*
Receive from RS232C interface*
Send to RS232C interface*
Enter RS232 terminal mode*

Although ROM may not, of course, be modified with these programs, it may be investigated, displayed or be made the object of a Jump Command.

WUMPUS

Probably one of the earliest computer games in an updated fresh version. The Wumpus is a mythical animal which is asleep (unless you wake it up, in which case you get eaten!) in one cave of a cavern containing 20 caves, interconnected by tunnels. You are provided with 5 crooked arrows (they go round corners) with which to get the Wumpus before he gets you. Unfortunately, some caves have pits in them, down which you can fall; others are the homes of Super Bats which can pick you up and deposit you in a new room. You are provided with various clues as you travel from room to room, together with information on which caves are interconnected by tunnels, so that you can hunt the Wumpus. If you choose the expert rating, you may have to cope with an earthquake which will move you around the cavern!

SORT

After the above glamorous offering, a straightforward one! In this program you are invited to enter words, collections of letters and figures or just collections of either and the computer will accept them, sort them into order and then display them. A simple program for a simple function — that is until you have to write them all down and sort them yourself! A word of warning so that you do not order something you do not need, this program sorts on the basis that the computer is firmwared, namely ASCII weighting. It takes no account of the value of the numbers. "A" will of course precede "B" and "AA" will go before "AB" and by the same rule "10" will precede "11" but "10" will be in front of "111" even though the value of the former is less than the latter, because the second digit in "10" is lower than the second digit in "111".

CROSS REFERENCE

This program maintains a cross reference file of all types of information which requires to be crossed. The information on the items to be crossed is maintained in data statements at line 1000. The reference list must therefore be built up by you, starting with that line. Obviously we cannot supply the information which you may wish to cross reference! Options in the program include: Seeing the pages of data, a page at a time; searching for a specific item in column A (assuming A is being cross referenced to B); searching for a specific item in column B; entering new data; searching column A for a contained string. That is of part number ABCDEF you can only remember BCD, but you need to know whether the full number is on file and what that full number is. Type it in and it will find the full number and display it, so that you can cross it.

LOAN

A loan amortization program for loans of all types, including mortgages. You are called upon to enter the amount of the loan, how many payments are to be made and the interest rate. The computer calculates and displays the amount of each payment and the total interest paid, which is fairly straightforward. However, enter the month and the year that the loan or mortgage will (or has) started and a complete Amortization Schedule will be displayed, containing the month and year each payment is due, the total monthly payment, how much of that is for interest and how much for the principal, plus the amount of the remaining principal. For peace of mind you are better off without it but it is a very good program for those who need this type of data.

PRIME NUMBERS

A straightforward mathematical program which determines and displays prime numbers. You may either have displayed all prime numbers between 0 and whatever number you choose or you may enter a number and the computer will tell you whether or not it is prime. It also tells you , in the latter case, by what number your entry may be divided. Did you know that 1234567 is divisible by 127?

BUZZWORD

This is an unusual one! And yet so simple that one wonders why it has not been thought of before. It has applications to salesmen, speech writers or makers and other persons, who in their job have to deliver speeches or presentations. There are, in the English language many sets of words, which, when strung together actually mean nothing, say nothing but sound very good and very authoritative! Many politicians use these phrases every day — seriously, they do. And they sound good. This program generates such phrases. Where in a speech or whatever you use them is up to you but wherever, the speech will sound more authoritative. Think on a ''total transitional capability'' for a while!
We would like to emphasise that this is a simple program. As mentioned above, it consists of a dictionary of unusual words which, when put together in various ways, create Buzzword phrases. There is nothing sophisticated about it at all.

DAY OF THE WEEK

This program takes any two dates after October 15th 1582, displays what day of the week they were and also the number of days between them. Useful in some professions but it is also a fun program. What day were you born on! How many days have you been alive! If you are interested in history, the Day of the Week will be of interest.

DRIVER

There are many versions of this game in which you are a racing driver trying to complete a course with the least number of faults. This UK written one is particularly good and features excellent graphics. Unlike others you only see the road ahead of you - not a plan of the whole course - so you are not able to prepare for corners ahead of time. The track is strewn with hazards and slicks of oil. The former cause a crash if you hit them and the oil may spin you towards the track edge, from which you may (with skill) recover. A running ''Best score'' is kept, so that more than one player can take part.

ACCOUNTS RECEIVABLE

This is a tape orientated program for the small businessman which carries out the functions of the Accounts Receivable Ledger. It is a single program which calls up three sub-programs at will. The first is the Initialize section, under this the user sets up the individual customers' files by asking for the customers' names, the invoice number, payment due date and the balance due. A running total of the amount due is kept as the entries are made, up to 200 files. When entered, all the data is stored on cassette. The second section, Maintenance, reads back into the computer the data tape and asks for update or alteration information. After this has been entered a fresh data tape is made. At any time the third section of the program may be called up which gives a choice of either listing all delinquent accounts or giving a synopsis of all accounts split up into their ageing state. A very useful program for users who are not using disks.

NEW STAR TREK

There are many versions of this game, we feel that this is the best! It has recently been improved to provide better graphics - you even see the Enterprise flying through space between galaxies! — and an easier operating mode. Of particular significance is the method of steering (if that is the correct word) the Enterprise. In other versions the direction data is input by a number. In this version it is actually possible to visually direct the course to be taken by means of a ''compass'' indicator. Rather than entering the various commands by number, an arrow is moved to the command required. Altogether these changes provide a very stimulating and realistic effect. You get the impression that you really are in command of a space ship! The guidlines of the game remain the same. As Commander of the Enterprise you are directed to explore the universe and hunt out Klingon Battle Cruisers. The universe is comprised of 192 quadrants containing planets, star systems, pulsars, black holes and Class 0 stars. The quadrants are three dimensional - 8 x 8 x 3. These are again divided into sectors. The weapon systems available are Phasers and Photon Torpedoes. Power systems are Warp and Impulse. You have the use of two computers, Science and Ships'. Long and Short range sensors are at your command together with Damage Control and Status Report. If you are going to play Star Trek you may as well play the best!

LEVEL III - A BASIC ENHANCEMENT

Level III is probably the most widely used enhancement to the Level II Basic interpreter supplied with either the TRS-80 Model I or the Genie machines. It has one big advantage over other enhancements in that it is written by Microsoft who wrote the original interpreter. It occupies just over 5K of RAM and contains something for everybody. The manual is complete, over 60 pages, and a pocket size reference card is also included. The enhancements are really split into two, the first part consists of entirely new commands and the second incorporates all of the disk Basic features which are not already a part of Level II, with the exception of the File Management commands. Level III features therefore contain:

Advanced graphics. An additional statement, LINE, can work in Character mode or Graphic mode. Draw a line, box or solid box by specifying two points. New GET@ and PUT@ statements let you save a graphic array from the screen and put it back at the same or different location. With only the PUT@ command, the array's location can be shifted in a sequence of steps to create high speed animation. These statements greatly expand the graphics capability of your TRS-80. You'll find yourself writing more programs with charts, graphs and even animation.

Renumber a BASIC program. Automatically renumbers the line numbers in a BASIC program as specified by the user.

Single stroke instructions. Also referred to as ''shift-key entries'', lets you enter any command, statement or string up to 15 characters by pressing the SHIFT key and a letter key (A-Z) at the same time. Maintains a list of 26 shift-key entries. Can be changed by the user with the new LSET instruction.

New SAVE and LOAD commands. Replaces the Level II CSAVE and CLOAD commands. Improves reliability of loading and saving programs on cassette tape. Eliminates the ''volume sensitivity'' problem of the cassette recorder. Programs saved with the Level II CSAVE command can be loaded with the Level III LOAD command, and vice-versa. Level III ''Saved'' tapes will CLOAD in Level II without the volume sensitivity.

INPUT LEN and LINE INPUT LEN. Allows you to write programs that set a time limit on INPUT statements. Timing is done by software so Expansion interface is not required.

Keyboard debounce. Corrects the Level II key bounce problem, preventing double characters.

Spelled-out error messages. Replaces Level II's two-letter abbreviations.

10 user-defined routines. Lets you have up to 10 machine language subroutines in one BASIC program.

LINE INPUT instructions. So you can input a string literal that will accept commas, semi-colons, colons, quotation marks, dashes etc. within the string. Eliminates the automatic ? in the INPUT prompt.

More flexible MID$. Increases string manipulation power by allowing MID$ to be on the left side of an equation as well as the right side.

INSTR function. Used to search a string for a specified substring. Can be used in text editors and command scanners to eliminate Level II.

User defined functions. Lets you assign a name to an often-used equation to avoid repeating it.

Hex and octal conversion. Accepts hex and octal constants in BASIC - useful for machine language subroutines.

In addition to the above, if an expansion interface is connected to the keyboard a TIME$ string function will be incorporated which works in a rather similar manner to a digital clock and calendar. Output to a RS232 port will be available if the interface contains an RS232 card. It should be noted that this RS232 section may not be compatible with the Video Genie machine, it will depend upon the model.

COMPROC - FOR DOS CHAINING

Another first from Harding's! This is a fascinating new program for disk users with a multiplicity of uses. It frequently happens that either non-technical persons are required to operate the computer or that an owner repetitively uses the same, or similar, routines when powering up. The function of this program is to take over control of the computer, either automatically or on command, and execute up to 9 Basic or DOS commands automatically. Provision is made for input from the keyboard during the operation if required. COMPROC therefore extends the DOS AUTO command to perform multiple steps either on power-up or as a single user system command. Running of multi command operations is reduced to its ultimate simplicity.
The program is used by constructing a special type of Basic Command File. In this the user stipulates the commands which are required to be executed automatically, the pauses (if any) which are needed for data input and other simple parameters. On power-up, or at any other time, the control of the computer is moved to this Command File, which then takes over and carries out its instructions. The Command File is written entirely in REM statements and may of course be changed at any time. A number of sophisticated features are included, such as automatic relocation of the program so as to not conflict with existing programs. Key Debounce is also included, to make it easier for non-technical use. This program comes about as close as you can get to a fully automatic computer!

BINARY - HEX - OCTAL - DECIMAL CONVERSION

Sooner or later when using computers it becomes necessary to convert between these bases, and that is precisely what this program does for you. Simply enter the number you wish to convert and its base, plus the base to which you wish to convert and there is the answer!

CASH REGISTER

This American program has been completely re-written for use in England and now operates in pounds and pence rather than dollars and cents. A couple of bugs have been cleaned up at the same time. Effectively, this program converts the TRS-80 into a Cash Register. As in the normal Cash Register, a receipt may be entered into any one of a number of different departments. These may be customized into any title required simply by changing a data line. As supplied they are most applicable to a corner shop selling groceries. Up to eleven (plus a ''Total'') departments may be used and the program will store up to 300 sales by department and amount. A total daily sales report is supplied together with a cash out routine. All data is stored in the computer and neither tape nor disk is used, although it would not be difficult to write a subroutine to enable the storing of each day's data if required. It is not suggested that the TRS-80, plus this program, is an economically viable alternative to a Till but in applications where the computer is also being used for other work in the business, this is a useful ''bonus''.

USER PROGRAMMABLE FILE HANDLING

A nice program for home or business use. It permits the user to set up a 100 (maximum) record file, which may be stored on a cassette and repeatedly changed or consulted. Each record consists of 5 fields (categories) of information, each consisting of up to 80 characters. Options include: Input data; list the names (or anything else) on file; search and edit the file; record the file on cassette and, of course, exit from the program. As supplied, the fields are set up for a name and address file consisting (for each record) of: Name, Street Address, City, State, Zipcode, Telephone Number and Birthday. But these categories may be changed by simply changing the appropriate titles in the program. The best value for money that we have seen in file handling programs. This is a tape orientated program. A disk file handling program is shown elsewhere in this list.

ACCOUNTS 1.2

This is a composite Accounts package for the small businessman, requiring 2 disk drives. A line printer is optional but if available hard-copy statements are supplied. The program will require small changes if a printer other than the Tandy Quickprinter (Centronics P1) is used. The program creates ledger files for an unlimited number of customers, with a maximum of 200 entries per file. Invoices, payments and credit notes may be posted to an account together with VAT amounts, invoice amounts and discounts. A ''card'' is maintained for each customer which may be called up at any time for inspection, modifications due to subsequent transactions or error entries. The cards are automatically serviced by the computer which supplies an ageing report giving details of invoices which are current, 30, 60 or over 90 days old. When the user calls for a hardcopy statement suitable slogans are included regarding the age of the invoices and a settlement figure is calculated allowing for a discount on the goods value of current accounts. Provision is made for incorporating a date entered at DOS level or it may be entered or changed during the program run. A ledger card may also be called up, which suppresses the ageing slogans and displays as a straight ledger sheet. This is a particularly flexible program, almost all parameters in it may be changed by the user without affecting the main structure. Attention to detail is shown in the incorporation of small refinements such as an automatic check of whether a line printer is connected and switched on, to save possible hang ups and the automatic deduction of payments from the oldest invoices, so that, if a credit note has been issued, prompt payment discount is not allowed on returned goods. The author, Mr. G. R. Excell, is prepared to customize this program to your own requirements at a reasonable charge. Full instructions are of course included.

INVOICE

This is an invoicing program providing printed invoices on a line printer using continuous stationery, together with other relevant information. It has particular application for users with only 16K of memory as it incorporates a unique method of program structure whereby various parts of the program are maintained as separate files on disk and are only called into memory from disk when required. It may, of course, be used with larger memory capacity machines as well. The program is made up of 8 sub-programs to perform the

following functions under the command of one of them, the Menu. The Invoice sub-program constructs the invoice itself and incorporates provision for delivery addresses other than the invoice address, manual data entry or retrieval from Accounts file and filing of the data or cancellation. The invoice is printed out and the invoice particulars are filed away in both the customer's sales file and the daily sales file. A file is kept of all customers details which not only includes their names and addresses but also the name of the ''contact'' at the customer's business. This list may be displayed in a convenient form at any time. A further sub-program is a mailing list which prints out the customers' names and addresses in a formatted form. The customer sales list sub-program prints out the total sales to all customers. A daily sales file keeps track of the invoices entered each day and prints out suitable data at the end of the day. A further file provides for deleting records which are no longer required. Altogether, a total program for the handling, printing and displaying of invoices. If continuous invoice stationery is not used, headings may be inserted where appropriate.

REAL TIME LUNAR LANDER

This real time Lunar Lander executes its descent with only one variable, the amount of thrust which may be varied in a range from 0 to 9. It is therefore a very easy, and enjoyable, program to use. Graphics are used extensively together with a continually changing display of the Height, Velocity, Time and Fuel Remaining. A useful added feature is the ability to command a demonstration, thus proving that a non-fatal landing can be achieved! The graphics show the Lander coming down an altitude display. The speed of its descent (or climb if you over-react) is relative to the thrust entered. A further graphic display is of the lunar landscape, which is different for each game. During the last 500 feet, the altitude display is magnified, which greatly enhances the enjoyment of the game.

AMAZIN

As the name implies, this is a maze game. The object is to travel from the top left hand corner of the VDU screen to the bottom right hand corner without hitting a block. As these blocks are placed on the screen randomly, and are continually changing, not only is each game different but you have to be fast to get through at all! Your travel is controlled by the four cursor arrows, which makes for an easily controllable progress.

LEVEL I IN LEVEL II RAM

It is often very useful to have both Level I and Level II especially when you have programs for both levels. This program will enable any Level II machine to be a Level I as well. It has a great advantage over the various hardware methods in that it is not necessary to do any conversion. Simply load the tape under SYSTEM and you are back in Level I exactly as if it were in fact a Level I machine. You have about 11K of memory available. All Level I commands are supported including abbreviations.

PAYROLL

This is a complete Payroll system consisting of four programs aimed at the small business user. It provides him with an easy method of pay calculation and storage and features ready access to month and year end information for tax returns. The system is tape orientated. The first program is for employee data preparation, which is used for setting up the system initially, entering data for a new employee or amending data for an existing employee. A separate tape is used for each employee. At first thought this appears cumbersome but in fact it presents some real advantages over having a number of employees on one cassette — which is of course quite feasible. A tape is, by its nature, sequential in form. A number of employees per tape would mean that most of the tape would have to be gone through to reach one which happened to be towards the end. Furthermore enough room would have to be left on each employee's tape section for future amendments and if an employee leaves then his section of the tape would have to be erased. Although more costly to start with, the separate tape method is cheaper in the long run and is far easier for the possibly unskilled operator to handle. Data for each employee includes:— name, N.I. code number, Tax code number, rate of pay, gross pay, tax paid and allows for whether or not the week concerned is week 1 or not. The second section of the system takes into account, and rectifies, the fact that after first initialisation to the computer, it will appear as if all entries were in respect of previous employment. Although the program can be run that way, certain facts would have to be borne in mind at the end of the year. To avoid this possible confusion this section can be run after initialisation to correct the data. The third section of the system is the main one. Provision is made for Normal Cumulative Suffix Codes, Week 1 Basis Suffix Codes, BR codes, Code numbers greater than 360 and the whole range of tax bands up to and including 83% rate of tax. Automatic transfer is made to the employees records on cassette of updated gross pay and all other data. Pay details are shown on the Video Display for each employee together with company details and a cash analysis. The final program in the system is a Company Summary by which the monthly amount due the Inland Revenue is computed and displayed together with complete Company details for the accounting period in question and the year to date. An Update service is available by subscription to allow for tax and N.I. contribution changes. As supplied the system is as general in nature as possible but changes to suit individual requirements can be made. Further, by changing the required PRINT statements to LPRINT, hardcopy can be supplied.

CORPLAN - RUN A COMPANY

Corplan is called an entrepreneur's business game. The player takes the part of the Managing Director of a mythical company which manufactures an equally mythical product called a ''Corple''. The business, which you are called upon to name, sells to a market over which it has a considerable degree of control. You are free to change the company's manufacturing, selling and financial policies to suit your objectives. The player is also called upon to make decisions as to the hiring and firing of employees, capital investments and many other factors which go to make up the success or failure of a business. On these decisions will depend the ultimate fate of the company. The game may be played by either a single player of a number. In the latter case, the players make up the Board of Directors and each player is appointed Director of Finance, Director in charge of Production and so on. In other words, it may be played as a one man company or as a Board. A unique feature of the game is that the player may set his own criteria by which a win or lose is determined. Perhaps a maximum amount of production will be your aim or maybe the employment of the most number of employees. Probably the widest goal to aim at is the maximisation of the return to shareholders. Information as to the company's progress, or otherwise, is fed to you in the form of reports and balance sheets. In the game you use forms which are supplied in the Manual and of which further supplies are available. The Manual is extensive. You are taken step by step through the game and in fact a specimen run is even supplied. The Manual and the cassette itself are contained in a very attractive binder which has ample space for filing your own notes and reports. Although the game comes on tape, it is written in Basic and may easily be saved to disk, which is an advantage as it is almost 16K long. Incidentally, you do not have to build the company from nothing! The game starts with 10,000 shares having been issued and various assets and liabilities in effect. No previous knowledge of finance or accounting is needed to enjoy Corplan.
An enlarged version of Corplan, logically called Corplan II, is also available. This required 48K and a disk drive. Both Corplan and Corplan II are exhaustive pieces of software, extremely well supported by documentation. The other side of that particular coin unfortunately is that they are expensive. They also, to our minds, have one small deficiency and that is if more than one person plays then he takes the part of another director on the same Board of Management. Elsewhere in this catalogue is described a program called Company Director which is similar to Corplan in its functions and it does have the advantage in that separate players taking part run separate companies in competition with each other. Company Director is considerably less in cost, but it must be emphasised that the presentation is not as luxurious. For instance, both Corplans come in a loose leaf binder, whereas Company Director has the usual typed sheets.

CALENDAR

This is a useful program from Brian Hastings. It displays a full monthly calendar for any month from January 1800 to December 2399. The display is particularly legible and easy to read as is shown at right. It only uses about 2.5K of memory, and with a bit of trimming it could be less, so, especially as it is in Basic, it lends itself to incorporation in other programs as a subroutine. In addition to the normal calendar information, the two left hand columns give the week number and day of the year number. The former are numbered in accordance with the British Standard 4760:1971 which decrees that the first week of the year starts with the first Monday and as this is the standard by which most government departments operate, the program has a wide range of applications. All English Public Holidays are shown by a leading dash against the appropriate date. See, for instance, January 1st — New Year's Day — in the illustration. In order to write this program Mr. Hastings has obviously done a great deal of research and it is completely accurate in a historic sense. Apparently, prior to 1871 there were no public holidays as such. Christmas Day and Good Friday were ''common law'' holidays and are identified in the display. In an Act of 1871 Easter Monday, Whit Monday, August Bank Holiday and Boxing Day were added as holidays — but only if they fell on a weekday! Various Statutory changes since then have been taken into account, resulting in a very professional piece of software. Mr. Hastings is prepared to quote for specialised versions of the program, if required. Direct any enquiries to us for onward transmission.

JANUARY, 1979

WEEK	DAY	:	MON	TUE	WED	THU	FRI	SAT	SUN
1	1	:	-1	2	3	4	5	6	7
2	8	:	8	9	10	11	12	13	14
3	15	:	15	16	17	18	19	20	21
4	22	:	22	23	24	25	26	27	28
5	29	:	29	30	31				

BIORHYTHM

Biorhythm is a theory which states that all of our lives are controlled by three life cycles known as Physical, Emotional and Intellectual. Each cycle is set at zero when we are born and transcribes regular cycles of 23, 28 and 33 days respectively throughout our lives, travelling from zero up to a most positive position then back down through zero to a most negative point and then up again to zero. As each cycle is of different timing they transcribe three separate sine curves and it is their position on any particular day of your life, which decides the type of day you will have. Whether you support this hypothesis or not it is undoubtedly fascinating to check back and forward in time to see how you were or are going to be!

DISASSEMBLER

A disassembler displays on the VDU or prints to a line printer a disassembly of the code contained in each individual address in memory. The display (or print) format with this disassembler consists of 5 columns: 1. The address in hexadecimal. 2. the contents of the address in hexadecimal. 3. The ASCII characters (if any) equivalent to the address contents. 4. The operation and operand(s) to be carried out in Z-80 mnemonics. All operands are in hexadecimal and the letter ''H'' is appended to them to show this. All Z-80 instructions are supported. All Monitor programs above have this function already.

OBJECT CODE RELOCATER

This program is a TRS-80 Object Code Relocater designed to move programs written in machine code from one area in memory to another. All recognisable branch addresses within the program are also changed to fit the new location. It is extremely useful when a machine code program which you have bought or written, conflicts with another program which you frequently run or make reference to, as either may simply be relocated to a more convenient point in memory. This program is contained in the Monitor 3 program above. Programs cannot of course, be moved into ROM. It is probably possible to move some section of ROM (Level II) into RAM but it will probably usually result in a reboot. Obviously the address to which the move is made must lay outside the boundaries of the block to be moved. The program can relocate itself in a new position.

COPSYS

This is a machine code program for duplicating and manipulating machine language tapes compatible with the Radio Shack Editor/Assembler. It will duplicate as many SYSTEM tapes as required as well as load them for use. In addition it features facilities for comparing a tape with a tape which has been loaded, in other words verification. This is done in a ''bit for bit'' manner and is an extremely useful function. Finally, it will combine machine language tapes, one with the other, into a composite program. It will not however, merge tapes in the true sense as each incoming block is added on to the preceding one — it does not ''interleave''. As imported this tape is suitable for 16K machines without disks. It should not be loaded, as is, into a machine containing DOS or Disk Basic. However, customers that own either Mon 3 or the Object Code Relocater programs listed above, may relocate this program for either larger memory machines or to get it out of the way of Disk Basic. Alternatively, as a service to our customers we will relocate the program to suit your machine, for a charge of four pounds.

SHARE PORTFOLIO

PRICE TREND IS ? SINCE 1 APRIL 1979
SHARE VALUE IS - SINCE 1 APRIL 1979
[OR \ INDICATES PRICE NOW EXCEEDS NORMAL LIMITS

NO.	NAME	COST	PCH. PR.	MKT. PR.	PROFIT/LOSS
1 [	WIT. NIGEL	470.60	0.2353	0.55	610.12
2	LONRHO	390.10	0.84	0.80	-30.50
3	WESTERN SELEC'N	1,502.79	0.30	0.29	-78.10
4 [	MESSINA	803.86	0.8039	0.92	99.97
5	GOLD & BASE	286.50	0.0955	0.10	1.90
6	NIL	0.00	0.00	0.00	0.00
7 \	EX-LANDS	194.50	0.1945	0.16	-46.10
8	ZETTERS	698.71	0.5187	0.48	-63.95
9	J HALSTEAD	1,062.91	0.4252	0.4350	5.53
10	NIL	0.00	0.00	0.00	0.00

This program is an analysis and maintenance system for private or company Share Portfolios. The data storage for the share holdings is contained on tape. It is a program which gives the user complete control of his holdings. A list of the most important items of information available to the user at all times, is given below. Facilities are, of course, available for updating throughout. In all cases automatic adjustment is made for Brokers Commission plus VAT, Transfer Stamp and the Contract Stamp. A specimen display of the summary of a holding is shown at right. A point to note is the use of the up and down arrows (they come out as a bracket and slash on the printer) to indicate ''extraordinary'' movements up or down. This is actually determined by testing for whether the smoothed average price exceeds the mean absolute deviation of the share price. The program is so complete that two Menus are used. The first, in addition to cassette input and output will access the full list of the Portfolio, details of one share holding, total value, a list of shares showing a profit, changes to holding details, changes to market prices only and the execution of a transaction. When the latter choice is made, the second Menu is called up which accesses the program sections governing: the buying or selling of a share holding, recording of a dividend, recording of bank interest, updating of the average price, updating of the mean absolute deviation,

recording of expenses paid, adjustment of the Capital and Cash accounts, transfers at year end and settlement with your broker. The most important details which are available to the user at a glance are as follows:

1. Cost of each holding.
2. Purchase price of each share.
3. Market price of each share.
4. Profit or Loss on each share, if sold at market value.
5. The number of shares in each holding.
6. Percentage of Profit or Loss on each holding.
7. List of details of profitable holdings.
8. Capital used to purchase the shares.
9. Total value of the portfolio at current market prices.
10. Total Profit or Loss on all shares held.
11. Total value, including cash balances, outstanding balance with your broker and total dividends received during the current year.
12. Percentage of gain on original capital.
13. Amount of capital set aside for shares.
14. Balance of cash available for future purchases.
15. Capital gains in the current year.
16. Balance outstanding with your broker.

KEYBOARD BOUNCE FIX

The double entry of a character has been a bug in TRS-80's since their inception. A hardware fix is to remove the top of the key and clean the contacts but the problem may re-appear. This program provides a software fix and is completely effective. It is written in machine code and resides at the top of memory. Simply load it under the SYSTEM command and this annoying problem disappears. Suitable for all memory sizes from 4K to 48K but your memory size must be stated on your order. This program is particularly useful when large numbers of entries are being made into the computer. It only uses a few lines of code, so it does not cut available memory down to any noticeable extent.

NEWDOS +

It is seldom that an item of software comes along which revolutionizes the usage of its host computer but such is the case with Newdos+. With the Tandy disk operating systems the TRS-80 is a good personal or business micro-computer. The addition of Newdos+ turns it into a completely professional machine with applications in any field. Most importantly it instils in the user a complete confidence in his machine, which after all, is a definition of a professional.

Newdos+ is a disk operating system. That is to say it replaces completely the Tandy DOS's. It is used in the same manner - in drive 0 - and any program or file previously written or used under TRSDOS 2.1 may still be used with Newdos+. But it is much more than a disk operating system for it contains a number of Utilities not otherwise available. The 2.1 contained a number of errors all of which are corrected in Newdos+. These errors led to frequent I/O errors and system crashes. These do not happen with Newdos+.

Newdos+ is such an important piece of software that we have written a "Sub-Manual" which we supply - in addition to the original documentation - free with every disk. The authors of Newdos+, Apparat Inc. of Denver in the U.S.A., supply a 32 page manual which is very comprehensive and contains all of the technical details required, in addition to user instructions. However, many users do not need to know certain technical details and it is with such people in mind that our documentation has been prepared; it is, in effect, a guide to the main documentation.

Probably the best way to describe Newdos+ is to list its features. Bear in mind however that its most important feature in not listed - a worry and fault free use of your system.

1. DOS commands, such as DIR, may be entered from Basic with a return to Basic.
2. Basic commands, such as RUN or LOAD may be directly entered from DOS.
3. It is not necessary to stipulate Memory Size or File requirements when entering Basic. Merely typing "Basic" will access Basic but if required memory space reservations or file requirements may be stipulated.
4. A reboot to DOS from Basic does not necessarily mean that the Basic resident program will be lost.
5. A complete renumbering facility is available by which not only may Basic programs be renumbered but also a check may be made on the validity of the resident Basic programs. Any error will be pointed out.
6. A REF command permits the scrutiny of a resident Basic program for variables, string or numerical, with a display of the line number in which the variable occurs. This command is extended to numbers as well. With this command GOSUBS and GOTO's etc. may be pinpointed and a check made as to whether variables have been used.
7. Shorthand, similar to Level I is provided. "E", "L" and "D" for instance will call up Edit, List and Delete commands. "E" will automatically enter the Edit mode for the last line.
8. The command "JKL" will automatically convert your line printer into a screen printer. A particularly useful function which, for instance, allows the print out of DIR contents.
9. A special command, DIRCHECK not only lists — or prints — the Directory for a disk but also automatically shows any errors in the Directory, which may be corrected with Superzap (explained later). This command even displays the byte number of the EOF byte.
10. Automatic Keyboard Debounce is included. It is no longer necessary to be concerned with this annoying bug. This is automatically incorporated at power up. Bouncing keys are simply forgotten!
11. A complete Disassembler is included. Disassembly is not only from memory but also from disk contents.
12. The Tandy Editor/Assembler has been improved.
13. Level I is available — including the facility of putting Level I tapes on disk. Hence, the user of Newdos+ has Level I, Level II, Disk Basic and the added facilities of Newdos+ at his command!
14. The 2.1 COPY command has been extended. Backup may be made in 2 ways — the second appropriate to backups which were impossible with 2.1.
15. Superzap. This is a Basic program which comes on the Newdos+ disk. It probably comes as close to magic as you can get on a computer! Broadly speaking, it is a program by which the contents of disks (or core memory) may be examined and changed at will. A single byte on a disk can be changed leaving the remainder intact. In other words complete surgery may be carried out on any disk. Previously unusable disks can again be made operational. Superzap contains the ability to completely unlock a disk — make all of its passwords ineffective. It also has the important facility of infinite attempts at Backup. Previously uncopyable disks can be backed up.
16. Sequential files, which previously could not be added to, can now be added to.
17. Machine code language programs can be put on disk from tape or other parts of disk. The program or data can be moved so that on re-entry it does not conflict with DOS areas. Any confliction is displayed on the screen.

18. DISKDUMP is enlarged to allow call-up by either sector number or logical record number. A real boon when working on data files on disk.
19. All Basic SAVEs and LOADs are automatically verified. You are always certain that what was in memory went onto the disk properly.

Frankly we do not know if we have included all the features of Newdos + , we keep on learning new uses for it! What we do know is that if you once use Newdos + , you will never use anything else!

Newdos + is supplied on disk ready to use and comes complete with documentation. The original documentation from Apparat is, to say the least, complex and difficult to understand. Molimerx, therefore have published two small ancillary manuals which hopefully will guide the user through NEWDOS + . It should be emphasised that these two extra manuals are only available from Molimerx and cannot be supplied separately.

Newdos + was first introduced into England by Hardings - another first!

RENUMBER BASIC

An extremely useful program by which all Basic programs may have their lines renumbered. Branches in the lines such as GOTO GOSUB etc. are automatically renumbered. There are two additional commands ''M'' and ''R''. The command ''M'' inserts a block at the end of the Basic in memory, so that further programs may be entered from the keyboard, tape or disk. When the user has completed this further program the ''R'' is then entered and the second program of Basic block is automatically appended to the first. This process may be continued as many times as required. The renumbering may start with any line number (within the machine's capabilities) and may increment by any value. This program is a machine language one and loads under SYSTEM. It may be put on disk with TAPEDISK and full instructions are included. There are three versions for 16K, 32K and 48K machines and orders must state which one is required. In default 16K is shipped.

''GSF'' GENERAL SUBROUTINE FACILITY

This is essentially a library of machine code language subroutines which may be either used on their own or incorporated into your own programs as subroutines. They may be nested into machine code programs or called from Level II Basic with the USR command. Some of them perform chores which could be programmed in Basic but, being in machine code, they perform the work many times faster than a Basic subroutine would. The program contains 18 subroutines as follows: 5 routines for display screen control scrolling up, down, left and right and for generating inverse graphic displays; 2 subroutines for drawing fast horizontal and vertical lines of any length or location on the screen; 2 subroutines for duplicating a byte in memory, particularly useful for the fast display of columns of figures; a subroutine for moving arrays in memory, for instance for rapidly setting one array equal to another; 2 routines for compressing and uncompressing data in memory; 2 subroutines for reading and writing arrays to tape, entire arrays can be read or written with one command; 2 routines for sorting arrays in memory, a 1000 element array can be sorted in 9 seconds! Frequently a Basic program is fast enough to perform 90% of the program but a dramatic increase in speed in one section can make all the difference! Please state your memory size.

REMODEL & PROLOAD

These are two Basic Program manipulation programs which now come on one tape. Remodel is a ''De-Luxe'' renumbering program which enables the user to carry out the following functions on any Basic program:

1. Renumber any portion of, or all statements in, a Basic program. All references in the program lines such as GOTO, GOSUB, THEN etc. are automatically renumbered.
2. Move any portion of a Basic program from one location to another. Again all references are changed accordingly.
3. Delete any portion of a Basic program.

Proload carries out the following functions on a Basic program:

1. Load from tape all or any portion of, a Basic program formerly saved by the CSAVE command.
2. Extend resident Basic programs by adding portions or all, of Basic programs read in from tape.
3. Renumber separately the added program lines and change all references accordingly.
4. Restructure the total resulting program by moving the added program lines to any location desired.
5. Save all or any portion of a Basic program, so that it may be later loaded under CLOAD or by Proload.
6. Verify that programs written to tape are correct.

Remodel and Proload are machine code languages which are stored in high memory for execution at will. They may be stored on disk. Execution is by way of the USR command. They are, in essence, architectural tools by which Basic programs may be manipulated.

DOSORT

This is a machine code language program for disk systems. It is a sophisticated sort and merge program for data stored on disk. It has no application to a non-disk system. Dosort performs the following functions:

1. Sorts files in accordance with sequences specified by the user. Multiple ascending or descending sorts may be carried out.
2. Two modes of sorts may be made - by string variables or numerical variables. The numerical mode permits the sort of singly dimensioned floating point, single or double precision and integer arrays. Character string sorts may be carried out on multiple fields within a record.
3. Data files may be spread across several diskettes.
4. Presorted files may be included in a given sort/merge application for merging.
5. User exits are provided during input output processing for specialized processing.

Dosort requires a minimum of two disk drives and 32K. System performance will be improved by additional drives and/or greater memory capacity.

NOUGHTS AND CROSSES

This one does not need any introduction. You have the choice of starting first or having the computer do so. It is possible to beat the computer but more likely it will end in a draw! Called ''Tic-Tac-Toe'' in the States.

MICROCHESS

This program will play chess with you in any one of three levels of skill. It is equally entertaining for the novice as for the experienced player. It includes En Passant capture and castling. The player may choose between white and black pieces and may even swop over during a game to see how the computer reacts to its own game! Positions may be pre-set for problem solving. The board and pieces are easily understood. Entry of moves is in algebraic notation and the player's moves are checked for legality by the computer before it moves the piece on the board.

SARGON II

Sargon II, for some years, has been the leading contender for the title of best all round microcomputer chess game. It has been made available for pretty well all microcomputers. It has two big features, the graphics representing the playing board are excellent and the quality of play is superb. Unfortunately the better the chess program gets at playing chess the slower it becomes. Sargon II is, in the higher levels, slow in its responses. Sargon II contains all of the normal functions of a chess game including En passant pawns, queening and castling. It has 7 levels of play. Levels 0-3 play in tournament time. A particularly nice feature is that it has a randomised opening book for all 7 levels of play for 3 moves. The board may be set up for solving puzzles, the board may be changed and, of course, the player may choose whether to play black or white. A hint to the player giving what the computer thinks is his best move is available for most non book moves. The player may resign at any time of course.

SPACE FIGHTER

You are in the cockpit of a space fighter out in space under the constellation of the Plough with 5 enemy fighters to shoot down. Get one in your sights just right, fire your missiles and he explodes in front of your eyes! User programmable functions include the number of missiles you have on board and a skill setting which sets the speed of the enemy. The number of enemy fighters may be changed by program alteration. Full graphics.

HAMURABI

For those who prefer a thought provoking game to an action one. You are appointed the Govenor of Sumeria for 10 years and your success or otherwise depends upon your handling of the country's land and resources. In particular, you are concerned with making such decisions as the harvesting of crops, the buying of land and the planting of how many acres to seed. Get it right and your people do not starve — get it wrong and we take no responsibility for what you are called!

SUBMARINE CHASE

Another action game, this time as Captain of a destroyer hunting a submarine in enemy waters. If your depth charges make a close enough drop, you will disable the submarine and you can close in for the kill. After each drop, the submarine's position in distance and compass bearing is given to help you find him. This Asdic information must have been delayed on its way to the bridge however, because it is relevant to his position when you dropped the depth charge — he will have moved a little since then! User choice of skill level. After the game you can display the submarine's course.

DOMINOES — FULL GRAPHICS AND REALISM

Long a popular English game, Dominoes has been rather ignored by microcomputer programmers. This version, however, by Barry Dunn is highly recommended. The graphics are excellent and show the bricks exactly as they appear in a normal game. The usual Dominoes rules apply. Start it with a double 6 or a double 5 and then on down to the point at which either the player or the computer has a double to start. The game is normally played against the computer, but a feature is included whereby the computer can play itself. The computer and the player each have 7 bricks. The player, of course, cannot see those owned by the computer, although there is provision for peeking. The computer cannot see the player's, and is not permitted to cheat. As play progresses, the bricks are laid end to end, automatically turning corners as the end of screen is met. If you cannot lay a brick you pass (called ''knocking'') and the winner is the one who plays all of his bricks first. The computer play has quite a bit of built-in skill but it is quite possible to beat it if you play a good game. We have found it quite addictive, probably because the games do not take too long to play so the fun is fast and furious — we highly recommend it!

SLOT MACHINE

If you like to play the one armed bandits, this is for you! All the old friends — cherry, bell, orange and so on. It pays off 84% (or so it says!) and obeys casino rules. Stakes and pay-offs are in dollars but if desired, this can easily be changed by LISTing and changing all ''dollars'' to ''pounds'' — makes it a bit expensive though! Exceedingly realistic graphic treatment of the slot machine window. It looks exactly like the 3 drums turning. The amount of the bet (it's a $1 machine), the pay-off for each go, how much you are ahead or behind and the % return are all continuously displayed. An interesting assumption is that if you have bet $5 and won $5, you are ''ahead''! Sounds familiar!

C12 — TWELVE MINUTE BLANK CASSETTE TAPES

These are blank versions of the tape that we actually use in production. They are specially produced to our specifications and are highly suitable for all program and data storage. They are supplied complete in library cases and with un-affixed labels.

BLANK CASSETTE LABELS

Customers always seem to need blank labels so we stock these. They are die cut white self-adhesive. Note that the above blank tapes are supplied with labels and thus these blank labels should only be ordered if extra labels are required.

BLANK DISKETTES

We are stocking the following types of diskettes: —

1) Standard 5¼" single sided, single density. These are normally Verbatim with blank white labels, but they could be other manufacturers'. Plus 5 free sleeves (see page 16).
2) 5¼" diskettes certified for 80 track. These are high quality diskettes and although they are only certified for 80 track, we have found them, without exception, to be suitable for double sided and double density use. Like the above, they may be blank labels or manufacturers' labels.
3) 8" single sided, double density disks for the Model II TRS-80 microcomputer.

Throughout the catalogue you will see some illustrations of printouts. These may have been produced by the program in question, but equally they may have been manufactured with a screen print facility. Hence the presence of a printout illustration does not necessarily mean that that program supports a line printer.

On another subject, customers may wish to know that a staff member conversant with the technical aspects of both the TRS-80, the Genie and our programs is always available at Molimerx during normal office hours. Outside of office hours an answering machine is provided to take such queries or orders on telephone line Bexhill 220391. Other telephone numbers supported by Molimerx will not have an answering service attached.

THE ULTIMATE IN BUSINESS SOFTWARE

tridata

SALES LEDGER | **PURCHASE LEDGER**

STOCK CONTROL | **PAYROLL**

INVOICING | **NOMINAL LEDGER**

ORDER ENTRY and INVOICING

From Tridata Micros Ltd. a complete professional business package for the TRS-80, written specifically for the UK market. With the exception of the Order Entry and Invoicing programs, any part of the suite may be used on its own or all together, as you please. Minimum machine requirements are 2 disks and 32K, preferably with a line printer. Some sample printouts are shown on the next page. A resumé of the program features are listed below.

SALES LEDGER	Maintain customer files. Apply postings. Display or list invoices and credit notes. Cash input and allocation. Generate statements. Aged debtors control report. VAT analysis report. List Sales Day Book. List Cash Day Book. List customers' names and addresses. Print address labels. Debtors list. Change VAT rates.
PURCHASE LEDGER	Maintain supplier file. Apply postings. Stop/release payment. Creditors control report. Creditors list. Printing remittance advices. Cheque list. VAT analysis report. List Purchases Day Book. Suppliers names and addresses. Print suppliers' labels. Change VAT rates.
NOMINAL LEDGER	Nominal postings. Nominal update. Trial balance. Profit & Loss Account. Options. Nominal File Maintenance.
STOCK CONTROL	Maintain stock file. Stock issues. Stock receipts. Stock movement report. Below re-order level report. Stock list. Stock price increases.
PAYROLL	Create new employee record. Amend employee record. Amend parameter file. Amend totals file. View spare numbers file. Calculate payslips. Coin analysis. Print totals. End of year summary. Delete employee. Amendments to package.
ORDER ENTRY/ INVOICING	This program is used in conjunction with the Stock Control and Sales Ledger. Order Entry. Order amendment and enquiry. Print orders. Invoicing.
INVOICING	This program is used in conjunction with the Stock Control and Sales Ledger. Print invoices and at the same time reduces stock and updates the Sales Ledger.

tridata

TRIDATA MICROS LIMITED D E B T O R S C O N T R O L R E P O R T PERIOD 6 19/06/79 PAGE 1

A/C NO	CUSTOMERS NAME	TELEPHONE NUMBER	YR-TO-DATE SALES	TOTAL BALANCE	AGE ANALYSIS CURRENT MONTH	ONE MONTH	TWO MONTHS	THREE MONTHS	OVER THREE	DATE LAST PAYMENT	CREDIT LIMIT
2	H J ANDERSON & CO A/C CONTACT - MRS CASE	021 440 1331	810.00	810.00	0.00	810.00	0.00	0.00	0.00		50000
3	ARTHUR ANDERSON & CO A/C CONTACT - MR J BROWN	021 233 2101	650.00	650.00	0.00	0.00	650.00	0.00	0.00		0
5	J & T WASTE REMOVAL SERVICE A/C CONTACT - PETE SEWELL	01 443 3966	328.00-	328.00-	403.00-	25.00-	100.00	0.00	0.00	18/06/79	2500

Debtors Control Report in Sales Ledger

TOTALS OF BALANCES OUTSTANDING

CURRENT MONTH	403.00-
ONE MONTH OLD	785.00
TWO MONTHS OLD	750.00
THREE MONTHS OLD	0.00
OVER THREE MONTHS OLD	0.00
TOTAL OUTSTANDING BALANCE	1,132.00
TOTAL YEAR TO DATE SALES	1,132.00

S A L E S L E D G E R 19/06/79

1 MAINTAIN CUSTOMER FILE
2 APPLY POSTINGS
3 RESERVED FOR OTHER SYSTEMS
4 CASH INPUT & ALLOCATION
5 GENERATE STATEMENTS
6 AGED DEBTOR'S CONTROL REPORT
7 VAT ANALYSIS REPORT
8 LIST SALES DAY BOOK
9 LIST CASH DAY BOOK
10 LIST CUSTOMER'S NAME/ADDRESS
11 PRINT ADDRESSED LABELS
12 DEBTOR S LIST
13 CHANGE VAT RATES

SELECT & ENTER LINE NO :_

Sales Ledger Menu

TRIDATA MICROS LIMITED S A L E S D A Y B O O K PERIOD 6 19/06/79 PAGE 1

DATE	A/C NO	CUSTOMERS NAME	TYPE	INV/CRN REF NO	NET AMOUNT	VAT AMOUNT	TOTAL AMOUNT
18/06/79	2	H J ANDERSON & CO	INV	INV-1	225.00	30.00	255.00
18/06/79	2	H J ANDERSON & CO	CRN	CRN-1	100.00-	25.00-	125.00-
15/05/79	3	ARTHUR ANDERSON & CO	INV	INV-1	575.00	75.00	650.00
23/04/79	5	J & T WASTE REMOVAL	INV	INV-1	83.00	17.00	100.00
15/05/79	5	J & T WASTE REMOVAL	CRN	CRN-1	20.00-	5.00-	25.00-
19/06/79	2	H J ANDERSON & CO	INV	INV1	600.00	80.00	680.00
		TOTAL			1363.00	172.00	1535.00

Sales Day Book in Sales Ledger

TRIDATA MICROS LIMITED V A T A N A L Y S I S PERIOD 6 19/06/79 PAGE 1

A/C NO	INVOICE/ CREDIT NO	DATE	INVOICE TOTAL	SALES @ 15%	SALES @ ZERO	SALES @ ZERO	EXPORTS @ ZERO	TOTAL OUTPUTS	VAT @ 15%	VAT @ ZERO
2	INV-1	18/06/79	255.00	200.00	0.00	25.00	0.00	225.00	30.00	0.00
2	CRN-1	18/06/79	125.00-	100.00-	0.00	0.00	0.00	100.00-	25.00-	0.00
3	INV-1	15/05/79	650.00	500.00	0.00	75.00	0.00	575.00	75.00	0.00
5	INV-1	23/04/79	100.00	83.00	0.00	0.00	0.00	83.00	17.00	0.00
5	CRN-1	15/05/79	25.00-	20.00-	0.00	0.00	0.00	20.00-	5.00-	0.00
2	INV1	19/06/79	680.00	600.00	0.00	0.00	0.00	600.00	80.00	0.00
		TOTAL	1535.00	1263.00	0.00	100.00	0.00	1363.00	172.00	0.00

VAT Analysis Report in Sales Ledger

HINTS AND TIPS ON THE TRS-80

These remarks seem to have become something of a tradition in our lists and will be continued in future. For the sake of new customers the remarks from previous lists (separated by a line for clarity) are reprinted herein, although it should be borne in mind that a lot of them are now out-dated. For instance, the earlier problems with disks seem now to have been cleared up, technical data on the machine is now freely available and so on.

The mystery of the "phantom blip" on the CTR-80 recorder — the subject of one of our Bulletins recently — continues to be obscure. We have had quite a lot of feedback on the subject but in all cases the problem only seems to arise when the recorder is used in unusual circumstances. We can however confirm that on all specimens of the recorder which we have tested, switching off the computer power during a tape load renders the tape thereafter unusable. Probably the only thing that should be said at this stage is that CTR-80 owners should be careful in their use of the recorder, probably more so than with the CTR-41.

An extremely useful technique for line printer owners is to POKE 16414,141 and POKE 16415,5 whenever it is required that PRINT statements should be interpreted as LPRINT statements. These change the driver addresses in the Video Display Control Block and obviate the necessity of having a series of LPRINT statements, if the same statements are present in a PRINT form. It is however most important that 88 and 4 be POKEd back after the LPRINT is finished with.

First — I don't profess to know any more than anyone else about the TRS-80! I have had one for quite a while though and have found without exception that other owners are friendly people and like to talk and read micros. So on that basis here goes with some disjointed comments, most of which you probably know already. Loading from tape can be tricky. Remember that the smallest volume adjustment can make all the difference. Lay a medium band radio next to the keyboard, tuned to a blank spot. You will hear the program load and with practice you know whether the load is going to be good. Don't believe the rule of thumb that no asterisks means more volume wanted and continual asterisks means less. The former is usually right but the latter often is not. If your program is tight for space, omit the final lot of quotation marks on a PRINT or INPUT so long as it is the end of a line. Some machines have a bug in the Expansion box if it is filled with memory. Putting 16K in is O.K. but with 32K it may fire up with less memory available than it actually has. With Level 2 LIST keep the Shift key down and use the @ as a toggle to see following lines. If you are into hardware you can "piggyback" a 2102 to get lower case characters but you may lose your prompt sign. It is possible to have Level 1 & 2 in the same machine by a modification but you have to be brave to do it! To cut down on cords, the power supply can go in the Video Display. Just heard this one so I'm not sure of it. You don't always get a syntax error for bad IF . . . THEN statements. Enter 10 IF 7 = 7 PRINT "ITS OK (the word THEN is usually optional of course). Prints out ITS OK but now edit out or retype to read 10 IF 7 PRINT "ITS OK. I still get an ITS OK. If you have a copy of the PINBALL program and have a bug in it, I have a cure. It's not in the list above as I don't have the rights to it. If you have real trouble with your cassette loading, unplug the mains and use batteries — cuts out background hum which can cause havoc. There is a better mod for putting in a Computer/Tape switch on your cassette than the one I suggested in PCW. Have the details if you want them. It uses the existing tone switch rather than a new one, and cuts down the volume if you like to listen to your programs. One serious omission in the Level 2 Manual is the lack of a picture of the graphic symbols referenced to the appropriate graphic code. I drew them out if anyone wants a copy or I have a list of a program to use as a subroutine to show this information on your screen. Although I have the Service Manual including the main circuit diagram of the machine, I don't have the Expansion box diagram. Anyone got one who is willing to part with a copy? If you get a lot of double entries from a particular key, pull off the key cap — gently! — and clean the contacts. Also make a cover for the keyboard from poly sheeting cut to size and taped at the corners. Use it and you will get less bouncy keys. Finally, a real oldy. The lower case hardware is in the TRS-80 so if you shift and press a letter the upper case code is used internally but the capital will be displayed as usual. This can cause unexplained syntax errors, so beware of the shift key!

First of all a plug for the TRS-80, although I would emphasise that we are not connected in any way with the Tandy Corporation. It has outsold all other microcomputers and is the most widely used micro in the world. It is also the best. Nonetheless any machine produced in such numbers is bound to have bugs and the discussion of them is in everybody's interest — even Tandy's, although I sometimes wonder if they appreciate the fact!

Expansion boxes and disks are now being widely bought in the U.K., so let's start with a few words about them. A recent Newsletter from the States stated that the Expansion has given rise to more problems than all of the rest of the computer put together. But take heart, the pregnant cable has arrived!! A modification has been made to the interconnecting ribbon cable between the keyboard and the Interface box. This takes the form of an active buffer and forms a bulge in the cable — hence the name. It is available in the U.S. and I believe it is either in this country or very soon will be. Pester your local Tandy store — maybe it will get here quicker! If you get a number of disk I/O errors, Tandy have a software fix. I will be happy to supply hardcopy of it on request with an SAE. There is also a keyboard bounce fix which is listed above. All DOS disks now issued have it on.

It is extremely hard to pin down whether or not there is a bug in exchanging disks. We have experienced problems in exchanging disks in the U.K. but on the other hand have received them from the U.S. without any problem. So far as I know all of the drives in the U.S. are Shugart 400's. Over here they are mostly Micropolis. Whether this has anything to do with it I don't know. I used to have Shugart but have been happier with Micropolis. As stated above, until the uncertainty is cleared up we are not guaranteeing programs on disk. May well have nothing to do with the machine, perhaps our Post Office has some equipment which disks don't like! Still on the subject of disks, if any of your diskettes has a problem cut a new sector hole and write protect slot for the other side of the disk and use that side, they are both the same!

The numeric keyboard addition to the TRS-80 is now being supplied in the States. It is positioned in place of the Radio Shack logo on the keyboard — let's hope that it will be here soon! It's obvious but — if you forget to press the record button on CSAVE and then CLOAD? to verify you will be hung up because the 80 can't find anything to verify. In Disk Basic pressing the reset will wipe out the Basic program. Put another tape with a program on it into the recorder and press play. You will get a "bad" error but you will be back to "Ready" without losing your program. If you are part way through a program and stop to edit or whatever, if you enter RUN you erase the variables. Use the GOTO statement with a line number and the program will restart with your variables intact. I haven't run up against this one myself but am told that after an INPUT# is performed from cassette, READ statements will automatically RESTORE data each time a READ is performed. A cure is to enter POKE 16553,255 before each READ is performed. Also, when performing an INPUT# from cassette the maximum number of bytes which can be read is 248. If you have an Expansion box and don't want to lose it, switch the box off and press the reset. You lose any data in the box but keep all that is in the keyboard.

In the Hints and Tips in the last list that went out I should have thanked the large number of people who responded to my mention in the first list, that I did not have a copy of the Interface circuit diagram. Belatedly — and ashamedly — many thanks. The first list was sent out about six months ago now and a lot of the Hints and Tips are way out of date. In fact, customers are now so knowledgeable, that it is hard to think of tips to pass on! So if a lot of what I say in this column is "old hat" to you, remember that it may not be to newer 80 owners. Some owners think that a bad cassette load only evidences itself by non-blinking asterisks, re-booting or similar catastrophies! Not so, it is quite common to get what appears to be a good load but still have program corruption. The best test is to CLOAD? against a known good tape or RUN the program. If you get an error statement of almost any kind, it may well of been a bad load. Consider what happens if a line number is corrupted, a UL error will probably result, which you probably will not immediately associate with the load. Don't multi-statement REM lines as anything following the REM is ignored: 10 REM XXX: PRINT "TEST" will produce nothing. For disk types the Disk Basic command CMD"E" is not mentioned in either the Preliminary Manual nor the Disk Reference Manual. Type it in after a disk error and you get useful details of the error. Owners used to losing their Basic programs when connected to the Interface, may not always remember that machine code programs remain in the computer on a reset or reboot. Sequential disk files are **not** like cassette files. One big difference is that you cannot effectively add to a sequential disk file without putting it into memory first, as every time you open it for sequential output the end of file marker goes back to the file start and the computer thinks that the file is empty. The Level II Manual (5/7) gives STRINGS$(n,character or number) as the STRING$ command but n can in fact be a variable — if A = 10 then STRING$(A,"*") returns 10 asterisks. May also be an expression — STRING$ (C-D,"*") will give the same if C = 20 and D = 10. A negative answer gives an FC error and a zero answer nuls the string.

AUGUST NEW LISTINGS

PACK/UNPACK — HIGH DENSITY STORAGE ON REGULAR DISKETTES

Now — an alternative to spending hundreds of pounds on new high density disk drives, the software approach to high density. A regular diskette on the TRS-80 will store 89,600 bytes. With PACK/UNPACK it will store 117,740 bytes — about 30% increase! How does it work? Funnily enough, relatively simply. Of the 256 possible combinations for an ASCII character only 64 are used for upper case letters, numerals and special characters. The remainder are for lower case, graphics and tab codes — some are not used at all. These 64 characters can be stored in only 6 bits but in Disk Basic characters are manipulated in 8 bit bytes. These extra bits are used by this program to increase the data storage. In other words, for each regular 3 bytes, Pack/Unpack will store 4. The normal random file buffer of 255 is thus increased to 340 bytes. As with the regular system, this buffer can be configurated as you wish although 1 × 340, 2 × 170, 3 × 113, 4 × 85 etc. will be standard. Another advantage of the program is that it performs its own input/output operations, so all the user has to do is to give it the data. The program is in machine code and will usually be added to a Basic program as a subroutine, called by a Basic USR statement. To illustrate its use, a sample Basic program, using the subroutine is included and a listing of that program is included with the Pack/Unpack instructions.

ADVENTURE — FROM SCOTT ADAMS

On page 2 of this catalogue is described the English series of Adventures entitled Mysterious Adventures. An American series exists, written by Scott Adams. This pre-dates the English series and as of the beginning of 1982 there are twelve in the series. These are as follows: —

1) Adventureland
2) Pirate Adventure
3) Mission Impossible
4) Voodoo Castle
5) The Count
6) Strange Odyssey
7) Mystery Fun House
8) Pyramid of Doom
9) Ghost Town
10) Savage Island (Part 1)
11) Savage Island (Part 2)
12) Golden Voyage

LINEAR REGRESSION — FOR MATHEMATICIANS AND STATISTICIANS

This is a straightforward Linear Regression program. Inputs required from the user are: whether a best line through the origin is required; whether the data to be entered is of equal weight; the number of points in X, Y configuration and after the analysis has been carried out by the computer, whether interpolation is required. Data provided by the machine is: best slope; standard error on the slope; degrees of freedom and if requested the interpolation of Y for X. Linear Regression is often included in higher costing statistics packages but often it is needed on its own. This program from an English author is reasonably priced to fill this need.

INFINITE BASIC — LEVEL I, LEVEL II, LEVEL III AND NOW INFINITE!

Infinite Basic is a modularised machine code Basic Interpreter which adds over 70 new Commands to regular Basic. An important advantage of it is that the modularised structure means that if space is tight, only required sections need be loaded into the machine. At this time we are not sure whether or not it is compatible with Level III and it is suggested that customers wishing to run them both together should check with us before ordering. The functions of Infinite Basic (so named because an infinite number of commands can be added in the future) are divided into two broad categories. Firstly, **complete** string functions are added including: left and right justify, truncate, rotate, text justification, string centering, deletions or insertion of substrings, pack strings, conversion to upper or lower case, translate characters, reverse strings, verify, test number of occurrences, masked string searches for simple or array variables, encrypt and decrypt strings, compress and uncompress character string arrays to six bits or less per character and very fast multivariable and string sorts. Secondly, complete Matrix functions are added including: matrix read, inverse, transpose, identity and simultaneous equations, add subtract or multiply scalars, vectors or multidimensional arrays, dynamically reshape expand and delete arrays, change arrays in mid-program, copy array elements, set arrays to scalar, zero arrays, move arrays, tape array read and write including string arrays. This program will be available as from September 14th 1979, orders received before that date will be shipped strictly in rotation.

AND — INFINITE BUSINESS

This is an add-on package to the above. It includes multiple precision packed decimal arithmetic which will eliminate round-off error with extreme accuracy. Also included is binary search of sorted arrays, insertion of new elements in sorted arrays, automatic page headings, footings and pagination including forced end of page and automatic hash for record retrieval. Same delivery as above.

BASIC REFERENCE — THE ULTIMATE BASIC PROGRAMMING AID?

If you program in Basic this program will not only cut your time by a substantial amount but it also makes some of the chores a pleasure! It automatically appends itself to any Basic program that you are writing — input of your program may be from the keyboard or cassette — and thereafter at the press of a key will list all of the lines in your program in which any of the following statements occur: FOR, DATA, GOTO, IF, GOSUB, REM, POKE, PRINT, =, PEEK. Although this program is in Basic it incorporates two automatically loaded machine code routines. Search for the above statements is therefore instantaneous. Tracing back subroutines, GOTO's and so on, which any programmer has to frequently do, is reduced to its simplest and most convenient form. Basic Reference may, of course, be used to append itself to any number of your programs. After your program is completed Basic Reference is merely deleted. At this time Basic Reference is only available for tape systems but a disk version is presently being written and should be available Mid-September.

> NOTE: A user with this program and Renumber Basic (see page 13) has a very powerful set of tools at his disposal. For this reason we are offering a 10% discount when these two programs are purchased together. Simply add the cost of them both, deduct 10% and add VAT.

MATRIX MANIPULATOR — COMPLETE NUMERIC ARRAY MANIPULATION

This program enables the user to set up a two dimensional array (rows and columns) of numeric data and thereafter manipulate it in accordance with some 33 commands. The array may be stored for later display with the Graph program following or by user written

regression analysis or other linear programs. Some four or five additional programs are in the course of being written which will be compatible and will form a complete suite. The Commands available in this program are as follows:

```
IR: INPUT BY ROWS      IC: INPUT BY COLS      IX: LIST INPUT CMNDS
LR: LIST ONE ROW       LC: LIST ONE COLUMN    LM: LIST WHOLE MATRIX
LE: LIST LAST ENTRY    LL: LIST LAST LINE     BS: BACKSPACE POINTER
LO: LOCATE POINTER     PS: SET POINTER        HO: HOME POINTER
DI: DIMENSIONS         MO: CHANGE MODE        CM: LIST COMMANDS
XR: EXCHANGE 2 ROWS    XC: EXCHANGE 2 COLS    IN: INVERT ROW OR COL
SR: SERIALISE ROW      SC: SERIALISE COL      SO: SORT IN ↑ ORDER
ZR: ZERO ONE ROW       ZC: ZERO ONE COLUMN    ZM: ZERO MATRIX
NR: NAME ONE ROW       NC: NAME ONE COLUMN    RN: NAME ALL ROW
CN: NAME ALL COLS      SA: SUM/MEAN/SDEVN     TR: TRANSFORM
BC: BLOCK COPY         SV: SAVE TO TAPE       QU: QUIT RUN
```

Maximum dimensions of the array are restricted only by the amount of memory available, although only 40 × 40 row or column names may be used. When saved to tape the array can be given a file name. This is a Basic program incorporating an automatically loaded machine code subroutine for high speed. Two versions of this program (and Graph below) are available — apart from 3 memory versions — one for Level II and one for Level III. Level II performs calculations in Single Precision whereas the Level III version has the option of Integer, Single or Double precision. Furthermore the Level III version has 3 additional Commands, 2 to set the real time clock and display time — for which an Interface is required and the third to enable and disable the automatic command listing. Very full documentation is supplied. This program is also available in a disk version where, of course, the storage is on disk. Its title is Prodata.

GRAPH PLOTTER — A SISTER PROGRAM TO THE ABOVE

This program may be used in conjunction with the Matrix Manipulator, and with storage media produced by that program, or on its own. Like the Manipulator, it will accept data from the keyboard or from store. Data may be displayed either in the form of histograms (bar charts) or as a line plot. Additionally the program analyses the data to display mean, standard deviation and where relevant median and mode. A large number of options are given to the user in both the display and type of analysis. Either rows or columns may be analysed for group frequency or single points. The display of the histogram or curve is exceptionally good giving options of block width, block height increment and the standard deviation range required. The number of undisplayed points, above or below the scale are shown. Bearing in mind the problems of displaying graphs on a computer screen, a particularly important feature is the ability to turn on the cursor when a graph is displayed and then move it so that it coincides with a graph point, whereupon the exact value of that point is displayed. A scale multiplier is always displayed. As with the Manipulator, extensive documentation is supplied.

MAILING LIST

This general purpose mailing list program is for the TRS-80 or Video Genie with one or more disk drives and at least 32K of memory. Any number of names may be handled, storage requirements are approximately 600 names per formatted disk. The program allows for the following fields for each name: —

Initial	Town
Name	County
Street Address	Postal Code
Suburb or Village	General

The General title as supplied has an unused status. The user may insert any field title that he requires. Search through the list with this entry as a key is supported. The following operations may be carried out on the list: —

1) Search for whether or not a name is on file and if it is display or print to a line printer or relevant data.
2) Search for a name when only part of the name is known or when the spelling is in doubt.
3) Delete or change any entry.
4) Add entries.
5) List the entire list either to a line printer or the display.
6) List either to a line printer or the display names and addresses only in label form.
7) List to the display or to the line printer entries in the ''unused'' field.
8) Make individual labels of any single name.
9) Access for search, deletion or change by record number. The record number of each record is displayed when the data for a particular name is shown.
10) Provision is made for a fast search. This has some restrictions however. The way that it is carried out is that the entire file is loaded into the computer when the fast search function is called. Thereafter the array which has been set up in the machine to hold the data is searched which means that a name may be selected within 10 or 15 seconds. The feature is of major importance when a number of names are going to be called from within the same file. Other searches in the program bring in each name from disk and search it until the correct one is found. Obviously having the names already resident in memory is far faster.
11) The user has the option of automatically listing all blank record spaces so that they may be filed under the Change command.

The program is friendly and mostly forgiving of errors. Graphic blocks are used to display the number of characters available on each entry line. The program is written as a low cost general purpose mailing list, suitable for a large number of applications.

RACE — A HORSE RACING GAME

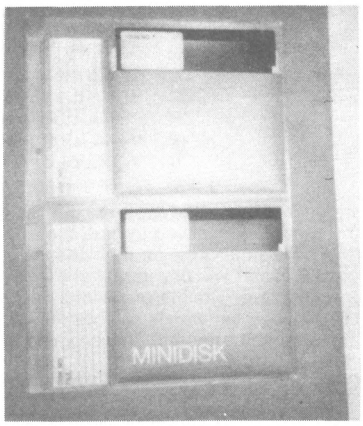
This is a fascinating horse racing game featuring extremely good graphics. The horses racing up and down your screen have to be seen to be believed. The player is given the choice of racing over fences or on the flat. Any number of players to six may take part and the players have the option of having up to four laps run in a race. Each player is allocated 100 pounds with which to bet. The horses in any particular race are chosen from a pool of 50 and the odds are posted relative to their speed and past performance. In the cassette version this performance is restricted to the game session being played. With the disk version performance is saved to disk and the odds are therefore based upon a longer period. After each player has placed his bet the race is run. After the finish, each player has his betting money adjusted, according to the odds. Providing at least one player has some money left — no credit is allowed! — another race is formed. If hurdles are chosen a horse may fall at a fence and this fact is indicated on the screen.

STOCK MARKET — GAMBLE IN SHARES WITHOUT RISK!

If you have always wanted a go at the Stock Market, here is your chance — without risking your own cash! The idea of the game is that you are given ten thousand pounds and two years within which to make a fortune — or go bust. The two years is divided into 24 periods of a month each. Each month you may buy or sell shares (in the latter case you must of course own them, and in the former you must have enough cash left) and at the end of the month all prices are affected by what has happened during the month. During the month you are given various tips from well meaning friends — which may or may not be correct — and items of general news which might affect the value of shares which you own. Market news may be that companies are on strike, still on strike, the announcement of new products, new developments, more investment into a company and so on. The bad news depresses prices and the good improves them.

Sometimes annual profit and loss news is given for a particular company which seriously affect prices. There are 10 share categories stretching from Banking to Industrials and each category contains five shares. You may either buy or sell in each category in order. At any time during the game you may call up a list of the shares which you own which gives details of their cost, any change, the number owned, average cost and profit or loss on the holding. Similar details are also given under each category of shares. If you have ever had an inkling that you might do well on the market (and incidentally its the English one not the American!) have a go and find out!

ACCESSORIES



These sleeves constitute a low cost approach to diskette storage and filing. They are plastic sleeves, punched for regular 8cm English two ring binder and the standard American three ring. They are simply filed in the binder and the diskettes are put in the pockets. Two removable index cards are inserted in their own pockets which have ample space on which to write disk contents information. The sleeves are made of stout vinyl and measure 8¾" × 11½" overall. Our binder may be purchased at its nominal price or you may use your own.

NEW!! An improved version contains slightly wider pockets so that the cardboard sleeve which accompanies diskettes may be housed — as illustrated. Not shown in photograph is a new universal punching so that the sleeve will fit any type of binder.

IMPORTANT

1. It is essential that customers state their TRS-80 configuration when placing an order, particularly the memory capacity. A large percentage of our programs now have different versions for different memories and shipping the wrong one only causes delays. Where a memory size is not stipulated we normally ship 16K or the lowest, if it is greater than 16K.
2. With the introduction of Newdos+ and Tandy 2.2 TRSDOS, the TRS-80 disk system is now reliable. Henceforth all programs which are disk orientated are normally supplied on a diskette. If a cassette version of a disk program is required, it must be so stipulated in the order and the price shown in the Price List may be reduced by two pounds. Furthermore, diskettes are normally supplied without a DOS system on them. If DOS is required, e.g. for single drive systems it must be requested, in which case a shortened version of 2.2 will be put on the disk without charge.
3. We support our software completely. If for any reason, including operator error, a program becomes corrupted we will repair it free of charge. If a customer has any problem in running a program we will do everything within our power to help. We want you as a regular customer and we will stand behind you at all times — you are never "out in the cold" if you have bought the program from us. The only thing that we cannot guarantee is that a program is bug free — no one can do that (see the terms of sale in the price list) but even if a bug does appear we will do the best we can to find a cure and, if it is important enough, print it in a future list.

HINTS AND TIPS

The big news since the last list is the general availability of the 2.2 TRSDOS. It will take a while for bugs to appear, or rather be confirmed, but one of some importance has come to light. When DOS boots into Basic it uses some of high memory **regardless** of whether that space has been protected under a suitable reply to Memory Size? If your machine code happens to be present in that location, it will be clobbered and be unusable. The extent of this usage is as yet unclear but occupation of the top 200 bytes of memory should be avoided. Any customers owning any of our machine code programs which nest at the top and wish to use 2.2 should contact us. What happens when you in turn clobber this code is uncertain — we have had some pretty weird results! Parenthetically, I often wonder why people enjoy running down the Tandy equipment and the company. Comments about other micros seem constructive and yet regarding Tandy they seem quite the opposite. O.K. all big companies have their faults and perhaps the size and the number of faults is linear, I do not know but I do know that some people, even magazines, seem to have a positive vendetta going on! It should not be forgotten that it is only about 3 years ago that customers were paying their money for micro kits, waiting up to nine months only to find that they did not work! Personally, I am very glad to have a TRS-80 and feel that it represents the best value for money on the market. The fix for the CTR-80 recorder problem, which was the subject of a recent Bulletin of ours, seems now to have been proven. Anyone having problems with the recorder and machine code tapes should carry out the following modification: unscrew the back (3 screws — 1 in the battery compartment) and trace the brown lead from the motor to the printed circuit board. This lead is actually sleeving covering two wires which come out of it on the board, one white and one bare wire. Solder a diode — 1 amp 50 volt — from the white to the bare, or there respective pads on the board, with the cathode to the white wire. The cathode end of the diode is usually marked with a continuous band around the body of the diode. Place a short strip of insulating tape on the board and bend the diode slightly towards it so that it is further pressed down when the back is replaced, it will not short to the board. Replace the back and the modification is complete. A number of customers have reported that this affects a complete cure and this is borne out by tests which we have done. Any customer who is not familiar with the problem and wishes to have more information should give us a ring. A small bug has been found in Level III by I. S. Addinsell whom we thank. If an out of memory error occurs after the program has been in the SYSTEM mode, the error statement may be corrupted to read OUT OF MEM (rather than MEMORY) or to display some garbage. Compliments of Nigel Dibben we have a fix for any customer who has bought the program from us. DEFine statements should precede DIMension statements. Try this: 10 DIM A(100) 20 FOR C= 1 TO 100:A(C)=C:PRINT A(C):NEXT and it will run fine. Put in 15 DEFINT A and you will get an error. Change line 15 to make it line 5 and it will run fine again. In a similar way string space should be CLEARed before DIM statements for strings, not after.

BAR CHASE — A GAME OF SKILL

Although this is one program it really consists of two separate games. In the first, you can elect to play one player against another, the player against the computer or the player against time. The game is played on the screen and — taking the player versus computer example — immediately the game starts, the computer will commence to move its dot around the screen, leaving a bar trace behind it. The player moves his dot and bar with the cursor keys (a Genie version will be available soon) and the object of the game is to contain and surround the computer's bar. When two players take part in the game, different keys are used. From the very commencement of the game, random obstacles are thrown up on the screen and, not only do you have to contain the computer's trace, but you have to avoid hitting any of the obstacles. Sound effects are provided. We feel that the second part of the game is the one with the most appeal. Unlike the first game, the object is not to contain a trace bar, but is to sail around the world by a practical route without getting sunk. The game was written by Mr. M. Norris, who also wrote Cube Hunt, which is mentioned elsewhere in this list, and he uses the same excellent graphic simulation of the world map in this game as he did in Cube Hunt. Again the map is divided into two as previously described and automatic wraparound of the map is provided. You have to return to your home port at Plymouth and during the journey you must not hit any land and you will have to avoid a number of hazards as you go. If you do not avoid them or if you hit land, then you will sink. There is more than one way of completing the trip successfully and there are lots more ways of not completing it!

OCTOBER NEW LISTING

COME AND SEE US AT STAND 39 !!

West Centre Hotel,
Lillie Road,
London.

1 - 3 November 1979

The 2nd PERSONAL COMPUTER WORLD SHOW

SUPA-TREK — REAL TIME STAR TREK

This brand new (and English written) version of Star Trek features excellent graphics plus a new dimension — time. Each game lasts 15 minutes and you have to get all the Klingons in that time. It also combines some of the features of ''Space Fighter'' and similar games in that you have to aim your weapons on the Klingon and hit him — after you have found him. Furthermore docking is not accomplished by merely impulsing or warping to the sector in which the Star Base is situated. Once you get to the quadrant you have to steer the Enterprise so that it actually docks — and it is not as easy as it sounds! As you are also fighting the clock (time is counted down and displayed continuously) things can get a bit tight! Apart from watching the clock you must keep an eye on the fuel remaining and how many crew members you have lost. The universe is made up of 27 quadrants or solar systems arranged in a cube (imagine 27 building blocks in a cube). The graphics are not the usual display of quadrants. You (as you would in real life) are continuously on the bridge of the Enterprise with the control panel in front of you. Through this you look out into space when you are actually in battle — so that you can aim your weapons — and at other times this area is used to display information. Star Trek has always been popular but has hitherto been more of an intellectual computer game. The accent with this version is on action! Requires 32K either Level II or Disk.

INVADERS — STOP THE INVADERS FROM LANDING

The Invaders program, both in computer games and dedicated television games, is such a well known activity that it hardly needs description. Essentially the player is presented with a large number of slowly descending Invaders represented by graphic drawings. To combat these he has a moveable laser base, this moves along the bottom of the screen behind a number of laser blocks. These blocks provide some defence for the laser base, but when hit by a bomb from the Invaders, a hole in the block is made through which a subsequent bomb can pass. In other words, the blocks are gradually eaten away. Unfortunately, if the laser base itself fires a laser bomb through the block the same effect is brought about. The program is written in machine language and is therefore very fast. It also supports sound. The big advantage of this particular version of the game is that almost all of the game parameters can be chosen at the start of the game by the user. In other words, the player has complete control over how fast the game runs, how many bases he has, how many shots may be in the air at one time and so on and so forth. So far as is known, this is the only version which does allow a player essentially to sculpt the game that he wishes to play.

VAT REGISTER — NORMAL AND VAT 'D' IN THE SAME PROGRAM

The intent of this program is to cut down the time taken in entering and calculating VAT returns so that in some respects the dreaded ''VAT Day'' is made at least partly pleasurable. Using this program, the only manual task of the user is to keep his Input and Output invoices — preferably in order and separately — and type the relevant information into the computer. A printed Register and Summary of Input and Output Tax is supplied by the program and it is from this that the VAT return can be easily completed. The program has been nicely written and is particularly aimed at those computer users with little or no experience. It should certainly be possible for an ordinary typist to enter the necessary information. Error trapping is included and indeed a complete VAT entry cannot be accepted unless it makes sense. All provisions are allowed for including zero and standard rate transactions. The VAT rate is changeable by the user and at the present time comes set at 15%.

COMPUT-A-ORGAN — THE TRS-80 BECOMES AN ORGAN

There are two distinct approaches to making your computer perform music. The first is to write software which enables the machine to be a composer. Using various techniques, compositions are fabricated, stored and then played back. The Tandy Micro Music is an excellent example of such software. This program uses the other approach which is to literally turn the TRS-80 keyboard into a two and one half octave instrument which instantly plays back the notes which are struck. In other words in the same way as an organ or piano. All four rows of TRS-80 keys are used in a logical way and they are made identical to the keys of the instrument, with black and white keys. You can play your computer! The problem is how do you hear it. If you do not want to make a sound box, the instructions for this program contain details of how to use your cassette recorder to play back through an earpiece connected to it. This is, of course a little restricted, so we have included in the instructions a free circuit diagram of how to build your own sound box. This only consists of one generally available integrated circuit and two capacitors, plus of course a miniature speaker and battery. Either way, if you can play a piano (or even if you cannot) you can play your TRS-80!

INDEX — AN EASY WAY TO INDEX A BOOK OR OTHER DOCUMENT

This is a specialist program written entirely for authors and others who have to index documents or objects. It affords a very real time saving to such people and yet is very simple in its use. A name and a number are entered, separated by a space. Up to 700 such entries are allowed. After the entries are completed the program will sort them and display, either by page number or by letter. This index may be saved on tape and later added to so that not all of the work need be done at one sitting. It is VDU orientated but the program can be modified by replacing a few PRINTs with LPRINTs to make it usable with a printer. Very simple and very useful!

Customers may wish to be aware that our current procedure on the mailing list is to issue a catalogue to a customer requesting it. He will then receive one update. If he does not order from the catalogue or the update, before the following update, he is taken off the mailing list.

HINTS AND TIPS October 1979

Previous Hints and Tips have not included any indication of their timing and a number of customers have been confused. Hence the date, which all future offerings will bear. The important news at the moment, and I imagine for some time to come is the upcoming Model 2. Tandy will probably have a machine on view at the PCW Exhibition in a few weeks. If they do I suggest that you try to get close to it — its beautiful! In reply to the customers who have been kind enough to ask (and the others) yes, we certainly will have software for it, and plenty of it! However, we intend to follow Tandy's undertaking and wholeheartedly support the Model I (i.e. the present TRS-80) at the same time. It cannot be emphasised too strongly that these two machines are co-existant, they do not in any way replace each other.

So the March of the DOS's continues! No sooner do we digest A.C.S.'s 3.0 and Tandy bring out the 2.3. The latter seems to rectify most of the bugs in 2.2 but the top of memory still seems to get clobbered, as reported in the last Hints and Tips. One customer reports that it is the first of the TRSDOS with which he can get sequential files to operate properly, so it would seem that the EOF etc. bugs have been cleared. We have decided not to stock the 3.0. Not, we hasten to say, because there is anything wrong with it but because it does not seem to us to be self supporting. For instance, it does not include a Basic so whether you like it or not you have to take this from a TRSDOS or NEWDOS which may not cause problems but seems clumsy. An extraordinarily large amount of space on the disk is taken up with instructions, which are repeated in the documentation which comes with it. As a considerable amount of software already in the market place and being used with TRSDOS or NEWDOS, is not compatible with 3.0, it seemed to us to be a complication with which customers could do without. It does, of course have a number of good points particularly the "device independent" feature which enables peripheral and file specifications to be exchanged at will. The subject is obviously too large for these notes but we will be happy to give any information on the telephone, to anyone who would like to know more — including the U.S. suppliers name and address.

Robin Kirby reminds us that we have never printed the formula for calculating the graphics codes, although in defence we would mention that they are described in our Text Editor instructions! If you imagine the six sub-blocks which make up the main block on the screen, as being numbered 1, 2, 3, 4, 8, 16 and 32 reading from left to right, then adding the total of any block(s) to 128 will give you the ASCII code number, e.g. 1 + 2 + 4 + 8 + 16 + 32 = 63 plus 128 = 191. Hence PRINT CHR$(191) lights the whole block of six sub-blocks. Probably a more useful way to use this technique is to make a variable equal to 128 then (for the above example) PRINT CHR$(A + 63) will also light the block. Whilst on this subject, a reminder that a number of these character strings can be added to make one string which can be manipulated as a string but is in fact a "picture". For instance if you need a little rocket ship frequently in a program try A$ = CHR$(179) + CHR$(157) + CHR$(140) then simply use A$ whenever you need the picture. This technique will allow some very interesting effects to be shown. In some applications the number inside the bracket can be set up in a data statement which can also incorporate line returns etc. for larger diagrams. The big advantage however is being able to use the diagram as a simple string. Try (after making A$ = the rocket ship) FOR C = 1 TO 6: A$ = A$ + A$:NEXT:PRINT A$. That's quite a string to be able to call up with simply A$!

The Level II Manual is a little deceptive when it says (page 3/2) that the PRINT @ specifier should be a number between 0 and 1023. It can also of course be an expression. If A = 12 and B = 13 then PRINT @(A + B), is the same as PRINT @ 25,. Another point on the Manual is the formula for using PEEK or POKE over address 32767, which appears to be incorrect. After 32767 the PEEK or POKE addresses assume negative numbers from −32768 down to −1, which equals 65539 or Hex FFFF. The correct formula for page 8/5 would therefore seem to be P or P address = desired address − 65536.

An additional, and I think better way, of constructing an INKEY$ string to the one shown at the bottom of page 5/5 of the Manual is to set up a loop. Thus —

```
10 FOR C = 1 TO A
20 IN$ = INKEY$:IF IN$ = "" GOTO 20
30 ST$ = ST$ + IN$
40 PRINT IN$;:NEXT
```

The last two lines can of course be made into one. The advantage is that the length of the INKEY inputs can be set and changed by the variable A. A less evident advantage (and rather nice) way of doing it is to change the PRINT IN$ in line 40 to PRINT "*" or whatever. Thus although a particular key is pressed, the asterisk is always printed and appears to be that key. This is in fact used by Tandy in one of their programs to "cover up" the password contents as it is typed in. A rather more interesting (but also more complicated) extension of this is to set up a random choice of numbers between 65 and 90 (ASCII A to Z), convert the number to a string with CHR$ and use the string in place of IN$ in line 40. Then even though one letter is typed, another will appear on the screen. The permutations are mind boggling! How about using CHR$(32) then nothing will be shown on the screen!

CHRISTMAS LISTING

SOME FANTASTIC NEW GAMES FOR THE HOLIDAY!

BATTLE OF BRITAIN — BY A SERVING RAF OFFICER!

Terrific fun — and completely authentic. The graphics of the SE England and NW France map is particularly good. Each time you play it is a different day in August 1940 and you have to not only survive but shoot down the invading planes as well. The game is cleverly constructed to make it a mixture of action and strategic skill. You are, in effect, not only an individual pilot but also the Air Marshall commanding the fighter forces. You have 13 Squadrons at your disposal, all at authentic airfields. It is up to you when to alert them and then when to scramble them into the air. Although you will destroy more enemy planes if you have more fighters up, don't forget that petrol and ammunition were short in those days! As the fighters go out on sorties, so you are given radar information on the approaching German bombers. The graphics of the actual combat have been very carefully prepared so that they give a close simulation of actual air battles. If you do not destroy enough enemy planes in the air, they will get through and bomb your airfields which further depletes your resources. During the air battles talking between the fighter pilots is flashed on the screen, to warn you of enemy planes on your tail or to tell you of other fighters which have gone down. Disposition of both the English and German Squadrons are shown on a map at the beginning of the game and every time you are compelled to return to base to refuel and get more ammunition. You can control the speed of the game for the action sections and you also have an overall variable skill level depending on how many hours flying experience you enter. If you like both strategy and action games this one is for you!

GALACTIC EMPIRE — THE DEFINITIVE SPACE GAME!

Forget Star Trek! This is not only far better but it is not an action game. It is entirely a game of strategy and cunning! Perhaps it is sufficient to say that it comes from the same stable that produces the Adventure games! If you want a quick action space game — don't buy it! But if you are prepared to spend some time pitting your wits against the Independent Galaxy forces, you will love it! The

graphics are extremely good, particularly the Star Maps supplied by the Computer Central and the Viewport. You are supported by a crew and officers, the latter have specific duties such as Navigation, Scout Ships Commander, Planetside activities and Medical. The latter is important as faster than light travel has not been discovered and it is sometimes important to put everyone into suspended animation! Broadly speaking the object of the game is to conquer and hold 20 inhabited worlds of the central galaxy system. To do this you have transports of troops, scout ships and you are able to levy taxes from conquered planets and to have new ships built on them. Careful planning is essential if you are to keep your fleet replenished as it moves through the Galaxy. When attacking technologically superior worlds it will be necessary to establish air supremacy first. Computer Central will keep you posted on losses as battles proceed and it will also give you a running success probability percentage. If you start to lose an attempt to conquer a world you had better withdraw or you may be too weakened to continue! Indeed if you lose all your fighters the Flagship itself may be attacked. Strength of the opposition in the air depends mainly on the technological sophistication of the enemy, on the planet itself mainly upon the size of the native population. But success is sweet! Once you have conquered a few worlds and have them building ships for you, you are well on the way to winning! Primitive and technologically limited worlds are useful to raise money and manpower but sophisticated ones are the only worlds which are capable of building transport ships to move your troops. A logistic game requiring strategy, ingenuity and daring!

MINEFIELD — A NEW VERSION OF AN OLD FAVOURITE!

Minefield games for micro-computers are quite common but this is one of the best we have seen. The idea of the game is to successfully cross a minefield in which a number of hidden mines have been laid. If you step on one you will be blown up. In order to help you across, you are equipped with a mine detector. Unfortunately this can only tell you that mines are in your vicinity, not their exact location and also it has limited battery life. You will probably have to go about a quarter of the way on your own. The field in which the minefield is situated, which you have to cross, is also strewn with rocks. These are a mixed blessing, for although there will not be a mine under them, they are too big for you to climb over! You may get yourself into the position where you are surrounded by rocks and mines! The rocks of course are visible. Your path through the minefield is traced as you go, so that you can always turn back and know that the path is safe — doesn't get you too far however, as you are supposed to be going forward! After the game is over you may view the placement of the mines — even if you have been blown up! Movement is effected with the four cursor arrow controls and automatically repeat if you hold them down, which lends itself to an easily played, and therefore enjoyable, game. The total number of steps in the field are 180 and as there are 20 mines and 20 rocks, the odds are set rather nicely! If you step on a mine and then choose to display them all, the one upon which you trod flashes on and off to separate it from the others. A nice touch which is the hallmark of a good program.

DRAW & GRAPHICS RESOLVER

This is a rather unique ''draw'' program with a number of unusual features. The drawing or sketching part of the program permits the user to draw any design on the screen. Control of the drawing line is with the cursor arrows and combinations of them will draw a diagonal line. Hitting the space bar first will reverse the drawing process, so that lines are erased or the cursor may be moved to another part of the screen, without leaving a line. Drawing may commence at any part of the screen simply by moving the cursor there in the erase mode or, alternatively hitting the Enter key which clears the screen and leaves the cursor in its last position. Whilst in the erase mode the cursor flashes to tell you that it is not in the drawing mode. The drawing routines have been written so as to make it extremely easy to make a design. After your drawing is finished it may be resolved. This is done by searching the Video Memory itself, rather than searching for Points. Two pieces of data are thereby made available to the user, the character string number of the graphic and its position in Video Memory. Using an unusual technique, the program stores this information away in Data Lines in the program itself, resulting in a program complete with data lines reflecting the design drawn. Whilst storing the information away, it is displayed on the screen together with a ''picture'' of the graphic block being read and when finished you are told the total number of Data entries that have been made. This technique (for which the author claims no originality) has a number of large advantages over the more normal one of storing the Set Points away on tape, the most important of which is that the data lines may be manipulated on their own as an ordinary Basic program rather than as pure data. Input and output from tape is considerably speeded up and it is not necessary to INPUT -1 or PRINT -1 as the data is already in the form of program lines. All that it is necessary to do is to Delete the drawing part of the program and then CSAVE, the result being a ''program'' consisting of just the data lines which may be incorporated in another program. This program is not compatible with Disk Basic at present. It may of course be stored on disk but it must be executed in a Level II environment.

PAYROLL — A NEW DISK OPERATED PROGRAM

This is a wages program for companies up to about 50 employees. Large organisations can, of course, be handled, but it would be better to break the system down into groups or departments in such a case. Furthermore, any item of business software has a ''break even'' point whereafter it becomes uneconomical in terms of cost and labour to use the program in question. Fifty employees is about the break even point for this program. The package covers all aspects of wage calculations and records required by the Government. Due to the multiplicity of different pension schemes, the provisions for pensions in the program are protected by REM statements. The customer is therefore able, to some extent, to sculpt his own pension requirements by removing or leaving the REM statement. The program supports changes of Income Tax or National Health Contributions straight from the keyboard. The program calculates a Weekly Pay or Monthly Pay, the latter selectable at 12 or 13 payments per annum. Provision is made for Basic Hours, Hours at one and a half, Double Time, Holiday Pay, Gross Adjustments, Nett Adjustments, Bonuses and Commission. Changes of pay and Tax codes are, of course, provided for. A Pay Slip may be printed for all employees containing all necessary information together with a coinage analysis. If an employee leaves, provision is made for entering the leaving date and the employee's last pay slip is followed by P45 details. Such an employee's file is thereafter not accessed but is carried forward so that the current file contains all employees, past and present. At any time a full data sheet can be printed out for any or all employees. A Ledger Sheet is printed out showing each employee's name and relevant details — Hourly Rate, Tax Code, Amount Paid, Nett, N.I. Employer and Employee, PAYE, Pay to Date and Gross. The Amount Paid, Nett, both N.I., PAYE and Gross are all totalled. In addition an analysis is carried out of the charges to Departments if required. Finally, on the Ledger Sheet, is given a Summary of the PAYE and N.I. The program has been written specifically with non-technical usage in mind. Data input takes about 4-5 minutes per employee initially and then produces Pay Slips at a rate in excess of one per minute. May be used with one or two disk systems.

ASTROLOG — FOR ASTRONOMERS AND ASTROLOGERS

This is a very full program for anybody who studies the heavens and is intended as an aid, in that it carries out the rather complex and mundane calculations necessary to calculate positional data for the Sun, Moon, 59 navigational stars, Inner Planets, Jupiter and Aries. The program starts by asking the user to input the latitude and longitude of the observation point. He must also input the height above sea level. The time zone correction will accept decimal hours as there are one or two places with hour fragment differences. Provision is made for readouts to be made automatically in GMT. The program is an interactive one and it has been made very simple to use, for instance, times are entered in hours, minutes and seconds, rather than as decimals. After an initiation date (the program is valid for the period from January 1st 1900 to December 31st 1999 for any place on Earth) has been entered into the computer and the celestial body chosen, two options are given. The first is to obtain data at a specified moment in time. This includes GHA, LHA, SHA, RA, declination, altitude, the azimuth and where appropriate, semi-diameter parallax and distances, together, in the case of the Moon, with its age. The second option provides rise and set for the day in question, time of upper and lower meridianal passage and altitude at upper meridianal passage. The plus or minus accuracy as minutes of arc are as follows: Sun 1, Moon 5, Stars and Aries ½, planets 10. Distance accuracy is to two decimal places, the Moon age to three hours. Parallax is within two minutes in most cases. The accuracy stated is the worst case, usually it will be better. This is a full and serious program written by an experienced observer. It may well be that these notes have not done it full justice due to our lack of knowledge of the subject, for which we apologise. It is written in Basic and supplied on cassette, but can, of course, be put on disk.

ANOTHER MAJOR PROGRAM FROM

HUBERT S. HOWE

(MONITORS, PACK/UNPACK ETC.)

DATABASE MANAGEMENT SYSTEM — AN INCREDIBLY VERSATILE DATABASE FOR TAPE OR DISK!

A Database program is a general purpose filing system which enables you to build files containing large quantities of information regarding a particular application and to manipulate the file in a number of different ways. A Mailing List program for instance is a dedicated Database, although you can manipulate the contents of the list you are restricted to the manner in which it is set up. If it is arranged with a certain number of lines for the name and address, then you are restricted to them. This program allows the user to decide how the file will be structured, what its subject will be and how it is to be manipulated. It may be used time and again to build different types of files; it is in effect a mother program which you may use to spawn any number of data handling programs, each dedicated to a particular application or use. So that we may be more easily understood, let us define a few words. A file is a collection of data arranged in records; each record contains a number of fields; a field contains either a string or a number. Taking our previous example of a mailing list — the complete list is a file; each person's data is a record and each line of the record (name, address etc.) is a field. If a field contains only digits it is a number, if it contains only letters or a mixture it is a string. Having got that sorted out we can more easily describe the versatility of this Database. First of all, it can use either tape or disk for storage and is compatible with Disk Basic or Level II. Consequently, so long as you have a minimum of 16K memory you can use this program! You have complete freedom when making the file — you define the number of fields and you define their contents. You can have as many or as few fields as you want, the only restriction is the amount of memory in your machine. Once you have created your file you can manipulate it by adding records, deleting them or changing them. They can be searched for a specific value or item in a field. They may be sorted either numerically or alphabetically. All of the data in a particular file can be totalled. The file can be printed on a line printer or displayed on the VDU. The manner in which the file is printed can be formatted in an incredibly diverse manner. To summarise these manipulations, the following is a list of the commands available to you:

A	Add records to a file
C	Change records in the file
D	Delete records — with automatic ''close up''
E	Exit program
F	Find any item
J	Justify the printing or display format
L	List the file on the VDU
N	New file creation
P	Print the file on a line printer
S	Sort the file
T	Total the items in a field
W	Write the file to cassette or to disk

To clarify the ''T'' command. It may be used in either one of two ways. Firstly you can total the numeric contents of the same field in all of the records. An obvious use is a file containing payments from individuals; one field would be set up for their name and a second for the amount paid. After the file is created, the program will, under this command, total all of the amounts paid. The second way is to total selectively. With our previous example, assume that men have to pay more than women. Create a file with three fields; name, amount and sex. This command will now total the second field in all the records, using the third as a key. That is it would total all of the amounts paid by just men — or just the ladies for that matter. Furthermore don't forget that this is a manipulation, the program is not committed, after adding all payments by men you could then total the ones paid by women!
As mentioned in the list above, when the ''D'' command is used to delete a record, all of the others close up so that there are no blank records.
When you choose either the ''L'' or ''P'' commands, you have the following choices as to format:

1. Print the entire file or a part thereof. If you choose the latter you will be asked for the starting and ending record number for the display.
2. Print or omit the field specifiers (name, address or whatever).
3. Print or omit the record numbers of each record. This incidentally is how you ascertain the record number, if you do not already know it.
4. List in numerical record order or sorted.
5. Whether or not you wish the print to be justified.
6. Whether or not you require the numeric fields to be formatted. If the reply is affirmative the format will be as for money, that is to say with 2 decimal places, leading zeroes suppressed and with all of the full stops between the pounds and pence in line under each other. If the reply is negative, the numerals are displayed as entered. In format mode a $ is automatically displayed to indicate the non-existant pound sign on the Tandy. This can be eliminated if required.
7. How many blank lines are required between each record.

As can be seen this is an extremely versatile and complete program for the sophisticated filing and manipulation of all types of file data. It is however, obviously, restricted by the amount of memory available and how that free space is allocated by the user. A program which uses a large amount of string space will have to contain less records than one which only uses numerals, as string space is reserved and inevitably there is some overhead. It is therefore impossible to give exact figures as to the number of records per file. In general a 48K disk system should be able to handle files of about 300 records of 10 fields each with 7000 bytes reserved for string space. A 32K non-disk system would probably be about the same with a bit over. A 16K non-disk system would run around 100 records of 10 fields with 1000 bytes string reservation and so on. Bear in mind two points, firstly halving the number of fields will double the amount of records and secondly we are only talking about one file. If your data can be split up into a number of files, then there is no limit to the amount of data you can handle. The program itself before execution, occupies about 6K.

SHARE DIVIDENDS — AN ADD-ON TO SHARE PORTFOLIO

On an earlier page is described the ''Share Portfolio'' program, an excellent piece of software for the complete management of share holdings. Incidentally, it was not mentioned that this program is just as applicable to company share portfolios as it is to private ones. That program only managed the buying and selling of shares, it took no notice of Dividends. This present program has been written by the same author to handle the Dividend management of portfolios. At the same time the author has re-written the original program for

disk. Accordingly, we now have available a disk program which handles shares and dividends (non-devisable) and two programs on tape, one for shares and one for dividends, which may be bought separately or together. The options in the Dividend program are as follows:

1. Enter new holding. This is self-explanatory, after the details are entered the new holding is automatically sorted into the existing file of holdings.
2. Display one holding. All data is displayed for a holding — Ex. Dividend date, Net Dividend, Date of Dividend Receipt, Amount, Total Dividends for the year to-date and a Total. Note that the total amount of dividends received from any holding is instantly available.
3. Display Full List. A list of all holdings, regardless of whether or not they have declared dividends is shown. Data included is the number of shares held, Ex. Dividend, Net Dividend, Dividend received and the amount.
4. Enter Dividend Data. Self-explanatory. Merely call up the holding and enter the dividend details. One of the useful conveniences in this program and the Share one is that it is never necessary to type in the exact holding name when calling it. Just a few letters will do.
5. Make New File. Whilst the file is being manipulated it resides in memory. After all alterations or whatever have been carried out a new file is written to tape/disk, using this command.
6. Outstanding Dividends. A very useful feature. Displays all holdings that have gone Ex. Dividend but payment has not been received. Each holding is shown one at a time.
7. Deletion. There are 2 options — either to delete an entire holding from the file or to delete the present year's details on all holdings ready for the following year.
8. Edit Any Item. This option allows you to change any item of information in any holding.

If you are running tape there is an additional option to input the tape data file. On disk this is done automatically at the start of the program. Whether you have tape or disk a demonstration data file is included so that you may get to know the program before using it on your own holdings.

INFINITE BASIC

The reports from customers about this program have been universally good and fully confirm our opinion that it is the best Basic enhancement software for string and matrix handling. Unfortunately, it did suffer from a poorly printed Manual — misprints, pages printed wrongly numbered etc. In accordance with our policy of complete back up, we have had printed an ancillary manual which consists of notes on the main one. Rather the same as we did for Newdos+. It is free for the asking to anyone who bought their Infinite from us. A point which we are often asked is whether Infinite is compatible with Level III. Unfortunately there is not a clear cut answer. Let us explain. The operation of Infinite is such that the user makes his own Basic interpreter containing as many of the 80 odd commands available as he wishes. This is called a module. It is not possible to construct this module under Level III as the program which makes it occupies much the same area in memory as does Level III itself. However, the module can be used with Level III. Accordingly, the procedure is to make the module in Level II but use it in Level II or III. Subject to that they are compatible and make very useful bedfellows!

HINTS AND TIPS December 1979

Unfortunately this column will be a bit short this time as we are hurrying to get this out for Christmas. Before we go into anything else may I take this opportunity of wishing everbody a very Happy Christmas — and a prosperous New Year. Also to thank customers for their continued support which has made this, our first full year of business, a very enjoyable experience. Either in an earlier column or in a magazine article, I once said that owners of TRS-80's seem to be very pleasant people, both myself and the staff here can re-confirm that statement.

There seems to be a small misconception about the abbreviation for the REM statement. It is not an apostrophe. A ' is an abbreviation for :REM. Try it in a line — 10 FOR C = 1 TO 10 REM COUNT will give you a syntax error but 10 FOR C = 1 TO 10 ' COUNT is fine. In other words the apostrophe **includes** a colon multi statement line delineator. As we all know PRINT statements use up space like mad. Although there is no real way round this, every character is going to take a byte whether you like it or not, space can be saved by using the downward arrow in PRINT lines. This does not save on the characters but it does save on the automatic line space overhead. Take a simple example, supposing you need to print on the left hand margin of the screen:

```
                    NOW IS THE TIME FOR ALL
                    GOOD MEN TO COME TO THE AID
It could be coded:  10 ?''NOW IS THE TIME FOR ALL
                    20 ?''GOOD MEN TO COME TO THE AID
Or                  10 ?''NOW IS THE TIME FOR ALL'':?''GOOD MEN TO COME TO THE AID
But far better is   10 ?''NOW IS THE TIME FOR ALL
                    GOOD MEN TO COME TO THE AID
```

The downward arrow does not, of course, appear in the listing. It is shown to indicate where to press it. Quite often you will see a line 30 PRINT to make a blank line between PRINT statement lines — just use the arrow instead! When Mr. Dunn sent in his new Dominoes program (you should try it, it really is good!) he attached the following routine which I regret I have not even had time to try out. It is handy for getting double spaced print. The crunch obviously is in line 30 which resets the hardware to normal sized print:

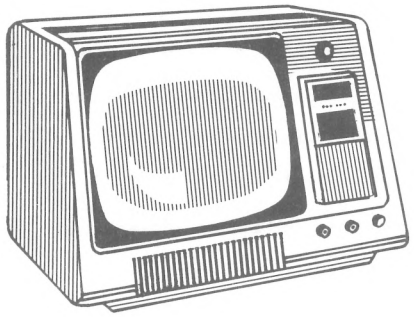
```
10 CLS                          50 ?CHR$(A+64)
20 ? CHR$(23)                   60 NEXT A
30 OUT 255,0                    70 PRINT:GOTO 40
40 FOR A =1 TO 30
```

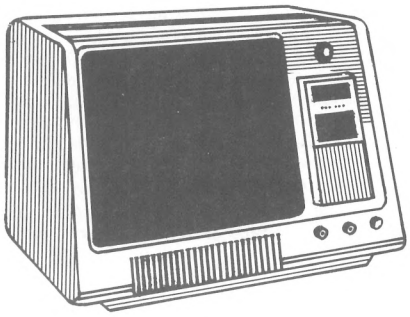
Finally the subject of NEWDOS (and presumably TRSDOS) and 40 tracks. The regular diskette is formatted for 35 tracks but the documentation for NEWDOS mentions 40 track capability and that beaver of the keyboard, Nigel Dibben (Matrix Manipulator, Graph Plotter, Plus/Basic and more next list!) has been kind enough to sort out the modifications which are necessary to make NEWDOS compatible with 40 tracks. These are available from us free of charge (an SAE would be appreciated) but first a word of warning. Some disk drives are not capable of accessing 40 tracks without running the head assembly off the spindle. Nigel does not have the regular Micropolis or Shugart drives and as yet we have not heard from anyone with enough nerve to try it on their drives. Anyway the point is that whilst we are happy to supply this information, you are entirely on your own. Neither Nigel nor ourselves can take any responsibility for any damage which may result.

DUEL-N-DROIDS — TERRIFIC FUN

A ''second generation'' Android Nim. Leo Christopherson has done it again! Two androids battle it out before your eyes with laser swords! There are two forms of play. In the first the player controls one android and the computer the other. The player must achieve a certain rank of skill as a swordsman to enable the android to go on to fight a tournament. The player's android is controlled by four keys and the higher the rank that the player can attain the better the chance that his android will beat the computer when it enters the tournament. Tournaments are of two types. In one, the player's android is pitted against an equally ranked android controlled by the computer. In the other the player's android fights against androids controlled by the computer of random ranking. Android Nim by Christopherson created something of a revolution in microcomputer games and Duel-N-Droids follows on in this same tradition. Excellent sound is provided in the program. Available on cassette for 16K machines and for the Video Genie. Disk version requires a minimum of 32K and one drive.

THE GREEN SCREEN





Continuing our policy of concentrating on innovative and original accessories for the TRS-80, we are proud to introduce ''The Green Screen''. This is simply and quickly affixed to the VDU by means of the adhesive tape supplied and significantly reduces the strain associated with using VDU's. Furthermore it actually improves the appearance of your machine. The Screen works by heavily filtering ambient light before it reaches the face of the cathode ray tube and again re-filtering the reflected light leaving the tube. This makes the normally grey background of the image, appear nearly black whilst leaving the light coming from the phosphur of the tube tinted a light green. This is the colour of the peak sensitivity of the human eye. The effect is further enhanced by the gap between the Screen and the tube face, causing a shadow region. The total effect is that of a highly professional, easy on the eye, display. The Green Screen is a real asset to TRS-80 users and we highly recommend it.
The Model I version of the above screen is, as shown, for the early Model I VDU's. The later units issued by Tandy have a curved case and on request come with a green cathode ray tube, hence they do not need a screen. TRS-80 Model II and III versions of the Green Screen are available at the same price.

Free Disk Sleeves for 5¼ " Disks

The price in our index for the single sided, single density 5¼ " disks includes 5 plastic storage sleeves which have been purchased for almost any type of loose leaf binder. These sleeves are described elsewhere in the catalogue. The 5 sleeves supplied free, of course, provide storage for 10 disks.

FEBRUARY LISTING

VISION LOAD — VLOAD YOUR CASSETTES RATHER THAN CLOAD

This program enables you to SEE your Basic programs as they load in from cassette. As the data feeds in to your memory it is also displayed on the screen! After the load, the program can be executed in the normal way so you can actually see whether or not you have got a good load. If the recorder volume is too high the display will increasingly be made up of all graphic characters. If the volume is too low there will be no display. The distinction between the two extremes is very pronounced, so the days of not being sure whether you have a good load until you list or try to run the program are over! Apart from the advantage of being able to see the loading level, it is rather good fun to be able to see and read the parts of the program which are in ASCII and it makes identification of the program immediate. The program is in machine code and occupies only two or three hundred bytes at the top of memory. It may be used as many times as you wish once you have loaded it. Yet another advantage is that each screen full represents 1K bytes, so by noting the number of times that the screen has been filled, gives you an accurate count of the length of the program. VLOAD is supplied in the three memory size versions on the one cassette or disk, so it is not necessary to relocate it if you upgrade your memory size. VLOAD may be stored and called from disk — simply load it in DOS and call it with the SYSTEM command in Basic. It does not, of course, operate when loading Basic programs from disk.

ENHANCED BASIC - A POWERFUL ADDITION TO LEVEL II

Enhanced Basic is an excellent addition for users operating Microsoft Level II in either the TRS-80 or Video Genie machines. As its name implies, it constitutes an enhancement of the interpreter giving the user a number of new commands. Probably its most important feature, however, is its ability to form a bridge between Basic and machine language. A number of microcomputer purchasers learn Basic and then wish to turn their attention to machine language or assembly language programs. This can be a difficult transition. EBAS, with its ability to change memory locations, include machine code routines without leaving Basic and its Monitor commands, constitutes a very valuable tool for such a transition. Furthermore, it sits at the bottom of memory and only occupies 2½K or so of RAM. Even in a 16K machine, therefore, there is ample room. It adds the following capabilities to Level II.

Edit on Entry. This feature permits entry to and return from Level II Edit mode whilst entering a line. It is of particular use when entering a long line. If, for instance you are getting towards the end and you spot a mistake at the beginning (or wherever) of the line, simply hit the shift up arrow and you are in Level II Edit and all of its commands are available without having to break. One feature of this command we like is that after hitting the up arrow, if you type the letter ''L'' you will be taken to the start of the line in front of the line number and can edit the line number as well. This is very useful if you have inadvertantly used a line number which already exists.
Recall Buffers. There are two uses of this feature. Firstly you can recall the last entry made after hitting enter. If you are in the command mode of the machine and you have entered say a Poke statement and you need to use it again. Normally you would have

to type it again but with this command you can simply recall it for further use. The second is to store any statement or string you wish away in a special buffer and then recall it at will. It stays in the buffer and may be recalled as often as you wish.
Cassette Motor Control. A command to switch the cassette recorder motor on or off. This is of particular application where you need to Rewind or Fast Forward from the keyboard.
Memory Size Change. One of the annoying features of the 80 is that you are only given one chance to set the memory reservation, when you first power up. If you decide in the middle of writing a program, that you want to change this reservation you must CSAVE your program, power up again and then CLOAD the program you are working on. This command allows you to change the reservation without loss of your program. It also permits you to reserve string storage space (normally done by CLEAR n) at the same time.
Close and Open. Allows you to ''shut off'' a basic program, carry out further inputs from the keyboard or tape and then remove the block so that the two programs are joined. The line numbers of the two programs must not conflict and the second program's lines must be numbered higher than the first. In other words, no merge is carried out.
Single Step and Breakpoint. This command allows you to single step through any basic program - either in execution or List. The Breakpoint command allows you to insert breakpoints in your program. This procedure is similar to the STOP and CONT commands available in Level II, with one all important difference. If you use STOP you have to edit the program to get rid of it and when you edit, all of the variables are cleared and lost; you have to RUN the program all over again. With EBAS the variables are not lost as it is not necessary to reRUN or edit.
Hex Constants and Conversion. Permits the use of constants in Hex notation. Thus POKE &H6FFF is the same as Poke 28671. Actually the ''H'' is optional, the above may also be written &6FFF. Conversions may be made freely between Hexadecimal and Decimal and normal mathematical functions carried out.
USR Calls. Unlimited USR calls are supported. A new command allows the transfer address to be specified with the call so that it is no longer necessary to Poke them in separately, as it is with Level II.
Instring function. The command INSTR is added to Level II. This command permits the search of one string to see if it contains another. Thus searching a string ''Smith'' for another string ''mith'' will return an affirmative answer.
Line Input function. LINE INPUT expands the normal INPUT statement by accepting commas and quotes within the input. Any leading blanks are not ingnored as they are with INPUT but are incorporated into the inputted string. The normal ? is not displayed when the machine is waiting for keyboard input.
Define Funtion. The DEF FN statement is supported allowing you to create your own implicit functions. Once defined it is only necessary to call the function by name and it will be automatically performed. Both string and numeric functions may be defined.
Machine Language Routines in Basic. This important enhancement allows you to include machine language routines in Basic programs, so that they may be called at will without leaving Basic. On entry the Z80 registers are given the values of 3 Basic variables and on return the same variables (plus AF% for the AF register pair) are loaded with the then value of the registers. This funtion is particularly easy to use as it is only necessary to assign a string variable with the machine langauge routine in Hex and call it, to execute the routine.
Monitor Commands. Four monitor commands are included in EBAS to allow you to examine, edit and search ROM or RAM (although ROM obviously cannot be edited) and to make a machine code tape for later reloading under the System command, as follows:

CMD B Sections of ROM or RAM will be displayed on the screen in both Hex and ASCII notation. Eight bytes are displayed per screen line together with the appropriate addresses.
CMD E Hex data defined in quotes is inserted into RAM in place of the existing code.
CMD S Allows you to search any area of ROM or RAM for the occurence of a specified string of hex code. Of particular significance is that the search is not restricted to one byte or even a two byte word, which can be very important when looking for a sequence of bytes.
CMD P This command allows you to Punch out a machine code tape from any area of ROM or RAM.

These commands all return the user to Basic after completion. With the CMD B command the user can step through memory by toggling each line with the @ key.
Cassette Loading Improvements. Last but by no means least is a command which replaces the CLOAD of Level II and seems to pretty well eliminate the problem which has bugged TRS-80 owners since its introduction, namely the difficulties experienced with loading tapes other than those made on the machine in question. When using this command the volume setting of the recorder is made far less critical. We have carried out a number of tests with this command and have found that tapes which were completely unloadable under Level II CLOAD can now be loaded without difficulty. We do not maintain that this command gets rid of the bug altogether but we do say that since we have been using it we have not found a tape that we could not load and we get a large number of tapes from all over the country, made on a wide selection of TRS-80s. The command - LOAD - is used in exactly the same way as CLOAD. LOAD? will work with tapes CSAVEd under EBAS. This command also displays a warning if a program already exists in memory. Very useful if you type LOAD instead of CSAVE!

In addition, Enhanced Basic is available on disk and is compatible with disk Basic. It is fair to say that a number of the above commands are already resident in disk Basic, but we feel that this apparent drawback is more than compensated for by an added feature that the author has made in the disk version. This is the ability to Load and Save to and from disk. This is more important than it at first appears because EBAS is an enhancement of Level II, hence when it is called from disk it exits to Level II and not to disk Basic. When one bears in mind that it has two commands mentioned, it means that EBAS can load and save disk files from a Level II environment. So far as we know, it is the only program that enables this to be done. A large number of programs can be stored on disk, but will not run in a disk Basic environment. EBAS enables these files to be pulled off disk and run in Level II.

Apart from the ''dedicated'' Basic programming aids such as Renumber Basic, Reference Basic, Remodel Proload etc., we are now stocking four different programs which form additions to the Tandy Basics. We thought it might be helpful to provide a table of their features.

Program Name	Compatible with	Occupies	Comments
EBAS	Level II	2.5K	Greatest interest to m/c or intended m/c users.
LEVEL III	LEVEL II	5.5K	General purpose but uses quite a bit of memory.
INFINITE BASIC	LEVEL II Disk Basic	Selectable	Specialised interpreter with wide ranging new commands for users interested in string and matrix manipulation.
LEVEL I IN LEVEL II	Level II	4.5K	Only of interest to those who wish to have Level I available with a Level II machine.

PLEASE NOTE: All tapes which we supply come with at least two copies of the program on them. If one is inadvertently damaged, then the other should still be usable.
We cannot emphasise too strongly how important it is to make back up copies of tapes or disks. Apart from the security aspect, tapes made on your own machine will always load more easily. If you cannot make copies of system tapes we really do recommend the purchase of Copsys or one of the Monitors.

ANOTHER MAJOR PROGRAM FROM

NIGEL DIBBEN

PROTEXT - A NEW DATABASE PROGRAM

Nigel Dibben's programs, such as Matrix Manipulator and Graph Plotter, are not intended for beginners or non-experienced users and this one is no exception. They are complex and require the operator to use some thought but if you are prepared to do that, you will be rewarded with some excellent software. On page 30 the use and application of Databases is described very fully and it is not intended that we should go over that ground again herein. In general, the two programs perform the same functions, so it is upon the differences that we shall concentrate. If you have not already done so, we suggest that you read the description on pages 30 and 31 before continuing. One of the major advantages of this program is that it has a built in text editor. A Database is intended for the manipulation and filing of text and a built in editor is very convenient. When the editor is available to you in the program the cursor is converted to a flashing cursor, so that you always know when it is available - which incidentally is 90% of the time. The editor has seven commands; four of them are concerned with the four arrows on the keyboard. The right arrow inserts spaces to the right of the cursor, expanding the text automatically, and the left arrow does the same to the left. The up arrow moves the cursor non-destructively left and the down arrow right. Shift left arrow deletes the whole entry and the clear key aborts the entire entry. Finally, hitting the enter key accepts the entry and moves the program on to the next entry or function. One of the problems with using string functions extensively on the 80 is that periodically it has to do internal housekeeping, the effect of which is that the machine appears to hang up while it is busy sorting out its string space. To say the least this can be disconcerting for the user. Although the problem cannot be entirely eradicated - the poor thing has to keep its house in order somehow - this program goes a long way towards a solution. It forces the 80 to do a housekeeping more often. In other words little and often pauses rather than a gargantuan seizure! Each file is given a ''mark'' which is automatically stored with the file. These may be deleted or changed at will and provide a very efficient method of finding selected data. Suppose, for instance that you use the Database to construct a file of your gramaphone record collection and you decide that you would like to access the file by choosing all the Beethoven recordings you have but not his piano concertos. Simply instruct the program to mark accordingly and thereafter the selection will be made automatically. The same applies for say a business file of people who owe you money. You need to be able to pull out only those that have not paid in 30 days — mark accordingly and it will be done! If you are using NEWDOS you may use a provision which allows you to inspect the file directory for any disk, whilst staying in the program. This is not available with TRSDOS. Three methods of search are permitted - either for the exact entry, that is search Smith with Smith as the key, or for characters in the same position as entered, for instance ...th for Smith or finally floating, such as ith for Smith. Remaining differences between this program and the one on page 30 are quite numerous but are chiefly concerned with presentation and the inputting of data. In summary, there is little doubt that this is the more complete program but you do have to spend some time getting to know it. This program is entirely disk orientated. It has no application for cassette users.

PURCHASE LEDGER - FOR CASSETTE

With disks finding wider application every day, the cassette user in business has rather taken a back seat! This one and the following program are an attempt to rectify this inbalance. This Purchase Ledger keeps track of a small business's purchases from its various suppliers. With a 16K machine it will handle up to 400 entries per month from up to 30 different suppliers. Provision is made for inputting credit notes as well as invoices and entering VAT. All suppliers may be listed and an analysis made of the transactions with them. All invoices or credit notes may be listed and totalled. The cassette supplied has two versions of the program on it, one for those with a printer and one for those without. Throughout the messages are kept as cryptic as possible to allow for as much data storage space as possible. Data is of course saved to and retrieved from cassette. Any cassette business program must suffer from limitations but subject to that this program should prove to be a useful addition to a small business.

STOCK CONTROL - FOR CASSETTE

The same stipulations must be made for this program as for the one above. On the other hand, within those restrictions it gives the cassette business user an adequate program. As a matter of fact, this is a new program and we are stocking it to replace the American Inventory Management Programs. The program is able to service up to 200 stock items at one time where 8 characters are allowed for both the manufacturer or supplier and description of the item. This program enables the user to have considerable control over his stock and to obtain all of the information he should require. The Main Menu contains 6 options in addition to outputting and inputting data from the cassette as follows: Input Stock; this option is chosen to enter the details for each stock item. Edit Stock; for changing details of the stock holding. Check Stock; call up entries either by stock name or supplier. Value Stock; this gives the user the net stock value. VAT payable on it and the gross cost together with the same information for the retail. VAT Due; supplies figures for the VAT payable on the stock. Daily Register; this option is used to entered sales during the day whereupon the stock holding is adjusted accordingly and a running total of the amount of each item of stock bought by the customer is kept. Nine items of information are retained on record for each stock item; Product Name, Supplier, Net Cost, Retail, VAT Rate, No. in Stock, Minimum Stock Required, Date of Last Sale and Date of Last Check. As can be seen the program is comprehensive and written to English standards. We recommend it to business users who are ''cutting their teeth'' on cassette prior to upgrading to disk as it does have a number of features which are present in larger disk software and also to users who have smaller numbers of stock items which do not justify the expense of disk.

STOCK CONTROL - ALSO FOR DISK

Since the above was published in the early edition of the catalogue, we have had a number of requests for a simple stock control program on disk. The author has therefore transferred the cassette program over to disk so that it is not only resident on that media, but also loads and saves files to it. It therefore constitutes a straightforward simple disk stock control program.

EDITOR/ASSEMBLER PLUS — AN UPGRADE OF TANDY'S E/A

Now get every feature of Tandy's Editor Assembler and T-Bug all in one package. PLUS - many ''big computer'' features to simplify your progamming, editing and debugging. Its no longer necessary to waste time creating both source and object tapes - Assembler Plus assembles directly into memory. Macros are supported, simply define a Macro and any frequently used sequencies are automatically assembled. Assembler Plus also supports Conditional Assembly with 2 pseudo ops, which enable assembly if a condition is true. There are 7 new expressions available, together with an automatic ORG, improved symbol print out and a Quash command to give you more storage space for general text editing. And that is all just on the Assembly side! The Editor is improved with extra commands like Substitute, Move, Copy and Extend for moving entire blocks and repeating them anywhere in the file, and for searching and substituting occurrences in old text for new text. A Range command is available for both Edit and Find enabling you to operate on a single line or a range of lines. Included in the package is a debugger called Z-Bug which includes all of the features of Tandy's T-Bug and features single step execution, direct execution in command mode and symbolic references, plus up to 8 breakpoints, rather than the single one in T-Bug. Editor/Assembler Plus is written by the original author and comes with an 80 page Manual - best of all it costs the same as Tandy's Editor/Assembler alone!

ADVENTURE — THE FULL ORIGINAL GAME ON DISK

The original Adventure was written for a main frame computer and was called Adventurel and since then there have been many derivatives. The best are written in machine code like the Scott Adams series (for which label we happen to be the sole importers!) but good as they are, they have had to be shortened to fit into 16K. This Microsoft Adventure is the original uncut main frame version, for the first time available for a microcomputer. Once you enter the Colossal Cave, your journey takes you through a labyrinth of caves containing active volcanoes, green snakes, sulphur lakes, killer dwarves, trolls, five foot oysters and many many more surprises before you can collect the 25 treasures and be a Grand Master! All the while directing your journey with commands and questions to the computer in English. Over 400 messages and descriptions are combined in an endless number of ways in the program vocabulary. Almost literally mind blowing!
This Adventure is, without a doubt, difficult. In the manual which accompanies it, it is stated that four pamphlets are available which, in total, would enable the user to solve the entire game. We have made arrangements with the authors of the game to reprint these pamphlets and they are available as a full set on a payment of a charge of £2.

ASSEMBLY LANGUAGE PACKAGE — DE-LUXE ASSEMBLY

A complete Assembly Language package for the user who requires the ultimate in programming aids. This package consists of a Macro Assembler, a Linking Loader, a Text Editor and a Cross Reference Facility. The Macro Assembler accepts Z-80 opcodes and supports a complete Intel standard macro facility including IRP, IRPC, Repeat, local variables and ExitM. The code is assembled in relocatable modules which offer the advantages of easier coding, faster testing, debugging and modifying. An expanded set of conditional pseudo ops allows testing of assembly pass, symbol definition and parameters to macros. Other assembler features include comment blocks, octal or hex listings, titles and subtitles, variable input radix (base 2 to 16) and a complete set of listing controls. The Linking Loader provides a number of loader capabilities executed by means of easy command lines and switches. Any number of programs may be loaded in user specified locations. Internal and external references between modules are resolved automatically. The Loader also performs library searches for system subroutines and generates a load map of memory showing the locations. The Text Editor is a random access line orientated text editor similar to those used on the IBM360 and PDP-10 computers. The Editor's speed and simplicity make it easy to insert, replace, print or delete lines; edit individual lines; renumber lines in a file and to find or substitute specified text. The Cross Reference Facility provides a convenient alphabetical list of all program variable names, together with the line numbers where they are referenced and defined.

MORSE CODE — LET THE COMPUTER TEACH YOU

This is a nifty little program for teaching you Morse Code. You will need a sound box or a small amplifier to connect to the grey plug which normally goes to the AUX input of your recorder. The program starts by asking what speed of code you want. Thereafter you have a number of choices. You can instruct the computer to output the code (at the speed you have set) for random letters, numbers or a mixture of both and optionally display the letter on the screen as the output is made. In the Training mode the computer will output a code and you have to type the correct key. If you type the wrong one the code will again be output until you get it right. In the Keyboard mode you type a key, the character will be displayed on the screen (optionally) and the code output. Regrettably we know nothing of Morse Code but it seems to us that this program would be an excellant way of learning! The speed may be adjusted at any time so that as you get more proficient you can increase the pace. This program is an excellent example of how a good idea can be converted into a useful piece of software, which in turn can give your 80 yet another application.

SMART TERMINAL — HOOK UP TO ANOTHER COMPUTER

This program intended for users who wish to use the 80 as a terminal to another computer, connected via the RS-232-C Interface and a Telephone Interface or Modem. Its basic purpose is to allow you to use the full capabilities of the 80 as a computer whilst also using it as a data communications terminal. When connected or ''logged on'' to another computer the 80 is in communication status. Any character typed at the 80's keyboard is automatically transmitted to the host computer via the interfaces and any character received from the host is displayed on the 80's VDU. When the interface is in full duplex mode, transmission may occur in either direction at any time. In half duplex mode, transmission may occur only in one direction at a time. In full duplex characters typed at the keyboard are displayed only after being ''echoed'' by the host. In half duplex the echo is provided by the modem so that the characters are displayed automatically. The Smart Terminal program supports many special features. In addition to supporting lower case (if your 80 has been modified) the program can also be set to receive graphics characters. Data received by the interface can be displayed, printed on the line printer and stored in memory. Memory files may be built and saved on cassette or on disk. Files may be loaded from tape or disk, stored in memory and then transmitted. The ''prompt'' character sent by the host to show that it is awaiting data — normally a ? — may be changed and redefined. This is not as frivolous as it sounds as problems can arise when prompt characters are being transmitted in the text. Smart Terminal will change the Baud Rate under its control without the necessity of opening up the Expansion Box to change the sense switches and the rate need not be one of those which can be set by the switch. An automatic test is continuously carried out internally, to make sure that the 232 interface is operating correctly and if it is not a warning is given. The test is carried out first thing when the program starts to execute, of course. In order that data may be held in memory for transmission or after reception, a memory buffer is created for the program. For a 16K machine this will be approximately 8K bytes long, 24K for a 32K and 40K for a 48K. In addition to being able to load the memory buffer from tape or disk, a unique feature of this program is the ability to type directly into the memory buffer so that the data so typed may be held for later transmission. A file may be written to tape or disk of the data typed in, which is very useful as you can keep a copy on disk or tape of what you have transmitted.
The program commands fall into two categories. Firstly, those that are operative whilst the machine is in communication status, which in the main are made up of controls for transmission or reception - Transmit line, End of Transmission, various tabulation controls, Line and Form feed and so on. Secondly, a sub-system which enables 25 commands for the program itself. These are accessed by a special command whilst in communication status and consist of the following:

LC	Upper/lower case	RF	Read disk file	CK	Change control key
UC	Upper case only	SF	Save disk file	CP	Change prompt character
EM	Erase Memory	RC	Read cassette	TR	Automatic transmission
TM	Type to Memory	SC	Save cassette	NT	Stop automatic transmission
BR	Backspace record	RM	RS232 to memory	LP	Line print
FR	Forward space record	NR	Stop RS232 to memory	NP	Line print off
CL	Display current line	ST	Display memory statistics	EX	Exit to Basic
L1	Set to first memory line	CB	Change baud rate	OS	Exit to DOS
SW	Reset sense switches				

This program therefore constitutes the software required to use your 80 as a computer terminal. As must be obvious from the above, an RS-232-C hardware interface (Tandy Cat. No.26-1145) is also required.

FORTRAN — FORTRAN FOR THE 80

The best Fortran Language Compiler for the TRS-80 - a standard ANSI Fortran from Microsoft. The package includes the Compiler, a Linking Loader, a Text Editor and a Fortran Runtime Library. The Compiler has a number of enhancements to the ANSI standard: LOGICAL variables which can be used as integer quantities, +127 to -128; LOGICAL DO loops for tighter, faster execution of small valued integer loops; mixed mode arithmetic; hexadecimal constants; Literals and Holleriths allowed in expressions; logical operations on integer date AND..OR..NOT..XOR can be used for 8 or 16 bit Boolean operations; READ/WRITE End of File or Error Condition transfer, that is, control may be transferred to a specified statement on end of file or error encounter; Encode/Decode for Format operations to memory. The standard library supplied includes 49 subroutines, together with routines for 32 bit and 64 bit floating point functions. Users may write non-standard I/O drivers for each Logical Unit Number - making the task of interfacing non standard devices to Fortran, a straightforward one.

ANDROID NIM — WITH SOUND

The game of Nim needs little introduction. It used to be played with matchsticks at one time. The idea is that there are a set number of objects and you and your opponent take turns removing them. The object of the game is to so remove the objects that you are left with the last one to remove. In this version the ''objects'' are cute little robots. In fact the graphics are so good that winning becomes of secondary importance to watching the androids' antics as they gradually get annihilated. The sound effects are as good as the graphics and cause the player to break down with concern for the poor little things! incidentally, both this program and the one following (which is from the same stable) intentionally will not list properly after a good load. It must therefore be played in order to ascertain that the load is good.

BEEWARY — ALSO WITH SOUND

Although the idea of this game is entirely different to the above, the graphics and sound effects are equally as good. The object of the game is simple, you have control of a little bee which moves around the top half of the screen. At the bottom is probably the most sadistic looking spider one has ever seen! If the bee stings the spider in just the right spot, the spider will die - it takes a good minute to do so, all the while lamenting on the cruelty of the world. On the other hand if the bee gets within range of the clutches of the spider, he will be eaten - again with suitable comments! See the comments above listing the program. Both games are extremely well done, they are simply fun games.

Z CHESS — A NEW CHESS MASTER, PLUS COMMENTS ON THE SARGONS AND MICROCHESS

To the ranks of Sargon I and II (both are in stock at the moment by the way) and Microchess is now added a new contender - Z Chess. Describing and comparing computer chess programs is much akin to trying to describe an eel! But it seems to us that the merits may be compared by considering two factors. Obviously the skill of play, but also the speed of play. Taking the extremes, a program which replies instantaneously but makes stupid moves is poor but so, in our estimation anyway, is a program which takes hours to make even a fantastically cunning move. One must, therefore, consider not only the skill of reply of the program, but also the time that it takes. Until someone comes up with something better, it is a fact that the more complex the reply the longer it will take. The reason for this is that most chess programs are constructed on a ''tree'' basis, whereby the program follows many branches before returning to the base to display its move. The more branches or possible moves that it has to look at, the longer it will take. The three principal TRS-80 and Genie chess games are Microchess, Sargon II and Z Chess. Microchess was the first program written and it is now some 3 or 4 years old. It is not surprising, therefore, that it plays a rudimentary game. It is not really recommended for anybody unless the use wishes to display how a microcomputer can play chess. It is moderately fast in response and will achieve the object of displaying how the microcomputer works quite well. As a serious opponent, however, it is of little value. Sargon II has two big things going for it. The graphics of the board are excellent, although the pieces perhaps leave something to be desired, and it does play the best game. Both Microchess and Sargon II are described elsewhere in this catalogue. Z Chess is probably a very good choice as an all rounder. It is still slow because it plays a fair game, but we do not think that it is as slow as Sargon II. The graphics of the board are probably rather poor, but they are quite usable. Accordingly when assessing Sargon II and Z Chess it could reasonably be said that if graphics and skill of play are important to you then Sargon II is the best buy. If a fair game with mediocre graphics are acceptable, then Z Chess would be the best choice.

DIRECTION FINDER — FOR PILOTS, TRAVELLERS AND THE SIMPLY CURIOUS

Although this program probably will have most appeal for pilots and travellers, it also has an educational content for the youngsters and those interested in geography. For two stated points it will give the following information:

1. Distance in nautical miles (knots.)
2. Distance in statute miles.
3. Distance in kilometres.
4. The compass bearing from the one to the other expressed in degrees.
5. The approximate compass direction - South West, North East etc.
6. A graphical representation of the compass rose with the postions indicated.

The two points may be entered in two ways. Firstly, stored in data lines are the latitudes and longitudes of over 125 major cities in the world. With these cities it is only necessary to enter their names to obtain the information. For smaller towns you may enter the latitude and longitude and the same information will be provided. Additional features are:

1. Distances and bearings plus the time taken.
2. Table of distances and times on a multi leg voyage.
3. Bearing, speed and time taken, corrected for wind.
4. A list of the cities and their data on file.

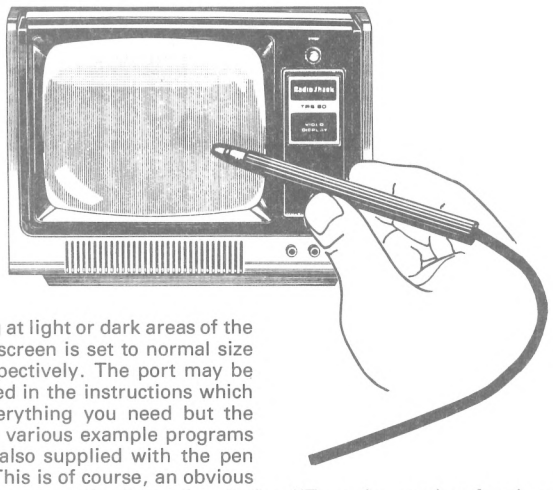
Although we have emphasised the global aspects of this program, we should also say that it will be of use to car travellers in England as well. A large number of the cities or towns on file are in the British Isles, even John O'Groats and Landsend! The accuracy of the program is good although some errors are bound to creep in, due to the machine itself.

LABYRYNTH — AN EXCELLENT MAZE GAME

Similar to a maze game recently published for another micro in Computing Today, this is one of the best we have ever seen. Normally with maze games, the player is given the plan view — as if he were looking down from the top — and one has to guide a ''third party'' with various control keys. Minefield (P.19) or Amazin (P.6) are good examples. However, in this game it is exactly as if you are in the maze yourself. Walls, doors and openings are shown and you have to make **your own** way through. Nigel Dibben, who wrote the program, (he has a warped wit, at the start rather than tell you that the program is initializing, you are told to wait whilst the skeletons are swept out of the maze) has given the player the option of using either of two aids. The first, called footprints, will tell you whether or not you have been in a corridor before and the second shows you continuously the direction of North. You may select both aids or either or none. Controls are supplied so that you may turn and look in any of 3 directions and of course a control to move in the direction in which you are looking. The maze is made up of 16 × 16 cells — the word is chosen deliberately!

ACCESSORIES

LIGHT PEN



Essentially a Light Pen is an instrument which, when wiped across the face of the VDU is able to differentiate between lighter and darker areas and outputs a signal when it passes from dark to light. The output signal is of course very low so it is fed through the cassette recorder amplifier before it goes into the 80. Apart from supplying the necessary amplification this hook up is very convenient, as it is only necessary to connect the plug from the pen to the AUX jack of the recorder and connect an ordinary 9 volt battery to the snap connector of the pen, to be completely operational. The computer ''looks'' at the pen through Port 255, the cassette port. So it is only necessary to input from this port in your program, to see whether the pen is looking at light or dark areas of the screen. INP(255) will return 127 for no light and 255 for light, if the screen is set to normal size characters. If it is on double size the returns will be 63 and 191 respectively. The port may be reset with the number 4 and 12 respectively. This is of course, covered in the instructions which come with the pen. These, incidentally are full and give you everything you need but the duplicated production leaves something to be desired! They include various example programs and routines for incorporation in your own software. A cassette is also supplied with the pen which contains two games for which the pen is used to enter choices. This is of course, an obvious choice for an application — games which require an input. Something along the lines of replacing ''Type the number for the choice required'' with ''Touch the pen to the selection required''. Certainly adds a bit of class! In fact the applications for a light pen are pretty well only restricted by the extent of one's imagination. The pen is well made and is dust proof. The connections to the cable and from the cable to the AUX plug and battery snap are moulded for long life. We will be supporting with software in the future and would certainly like to hear from authors with programs written around the pen.

HINTS & TIPS FEBRUARY 1980

First of all this month is a small little point which probably you all do anyway but it arose the other day when I was watching someone using their machine. He wanted to find out how much area of RAM a program was occupying. So he typed ?MEM and then deducted the figure displayed from his normal free space to obtain the information he required. All he needed to do was type ?15572-MEM to get the number of bytes used by the program — the 15572 is for a 16K machine of course but whatever free memory you have on your machine without any code on board may be entered. Sorry, as I said you probably do it anyway but it seemed worth mentioning. Another tip is not mine, it is unashamedly cribbed from Kilobaud magazine. Some VDUs suffer from slight blurring of the characters. If you open the back of the VDU you will see a wire running from the terminal post at the front of the horizontally mounted printed circuit board to pin 2 of the cathode ray tube — probably green in colour. The dress of this wire is important to the quality of the display it should be as much in the ''open air'' as possible. If it runs too close to other components or to the chassis, high frequency response can be lost. The author also suggests replacing the 1500 ohm resistor to which this lead is connected with a peeking coil of about 100uh but I think that this should be carried out with caution and only if you are sure that you are lacking in hf response. If you are interested the article is on page 114 of the December issue — if pressed we could probably do you a photostat if you don't have the magazine. Normally this column is kept for hints and tips which we pick up along the way — incidentally if you have some tip worth passing on PLEASE **write**, my period of retention for phone calls is very close to zero — but this month I would like to throw some thoughts out for you to play with, if you feel like it! I personally think that with very few exceptions the various Tandy manuals are excellent (don't remember that provisional DOS one!) but being good they build confidence and one tends not to think beyond them. We are told for instance, that in Basic if we type NEW or CLOAD another program, all previous data is lost. But if you think a bit about it machine code in protected memory isn't (actually not much is but it is a bit of a job to get it out again) even on a Reset. The manual says that the memory reservation is to protect machine code programs but there is really no reason why we should not poke data up there to keep for another program or simply to use from the command mode. We can even poke into memory below the start of Basic i.e. below 42E9H (17129 decimal) and it will be safe. This is a bit more tricky however as the area between 16512 and 17129 is dangerous country unless you know exactly what you are doing — incidentally I am talking about Level II throughout, DOS and Disk Basic will be different. Take an example. In Disk Basic the addresses 16449 to 16454 are used to store the time and date for the TIME$ command — disk users, try and peek them it is an easy way of reading the time and date without going back to DOS — and I would be willing to bet that they are not used in Level II, so there is room for six bytes which should remain untouched by changes in Basic programs. But for larger storage it is far safer to use protected memory. Try this to see what I mean (still on 16K):

Answer Memory Size with 30000 then enter these couple of lines

```
10 FOR C = 30001:POKE C,65:NEXT

10 FOR C = 30001 TO 31000:POKE C,65:NEXT
20 FOR C = 30001 TO 31000:?PEEK(C);:NEXT
```

Line 10 pokes a lot of 65's and 20 peeks them out and prints to show that they are there. I chose 65 because it is an ASCII character and can easily be converted into an ''A'' if you wish. Now type NEW or CLOAD a Basic program or Reset or do (within reason) what you want. After you have done your worst type NEW if necessary and enter line 20 again and RUN. Low and behold the data is still there. As I said at the beginning this is all food for thought rather than tips — see what you can make of it! As a parting shot, how many of you I wonder, after making an error in line (say) 10000 type EDIT 10000. That ''.'' abbreviation on page 1/7 of the Level II Manual tends to get forgotten.

SHARK ATTACK — HUNTING THE DREADED KILLER SHARK

This is a graphic orientated game in the sense that it is played on a grid rather than by conversation. You are the captain of a small ship and the object of the game is to find a killer shark. You are aided by a sonar scanner and you have to fire your harpoons. You will be required to input the direction and angle. The shark can attack the ship and, of course, there are various hazards, such as shipwrecks and buoys. At the time of going to press this game is not compatible with the Genie, but the necessary modification will probably be completed by the time you receive this list.

APRIL LISTING

SBT — STRUCTURED BASIC TRANSLATOR

Basic, excellent as it is, has one or two failings which we feel are corrected by this new program. In machine language programming and indeed in programmable pocket calculators even, it is possible to label an address. In other words, rather than saying GOTO or GOSUB 100, the contents of what would be line 100 are labelled and the GOTO and GOSUBs are directed to the label rather than to the line number. If you think about this, it is a really big advantage because one doesn't have to know, in fact it is totally unimportant, where the contents of the sub-routine is. Another drawback of Basic is that it is number structured. As we all know, it is imperative that a Basic line be preceded by a number. If it is not, quite a few terrible things can happen. This is a very free system, though it does cause problems. It is convenient in that line numbers have to be spaced to allow for later insertions, but most importantly, again with GOTOs and GOSUBs, one has to know the line number when one writes the directing line. Finally, the other big deficiency of Basic is that remark statements (REM) take up space in the program. They are, in fact, part of the program itself. The tendency, therefore, is either to omit them because being ASCII letters they take up a lot of space or, one keeps them as short as possible, with the result that when you go back to a program a year or so after you have written it, it is often very difficult to understand. SBT gets rid of all these deficiencies. It has some similarities in structure to machine language programming, but yet retains the ease of the Basic syntax. To use SBT you ''assemble'' a code in an editor in a similar way to machine language. You do not use any line numbers and the branches are to labels rather than to line numbers. Furthermore, comments in the program are not assembled into the resulting program, but do remain in the source program. Hence, if you have to return to look at the program later, it is very easy to understand what you originally did, but yet comments do not take up any room in the actual operative program. After the program has been composed in the editor, it is assembled or translated by SBT itself and the result is a normal Basic program with all of the line numbers inserted and all of the branches correctly referenced by line number. Broadly speaking, therefore, it is possible to say that one has the ease of writing a program in an editor with subsequent assembly, and yet finishes up with an ordinary Basic program. SBT is disk orientated in that the programs are written to disk and it is supplied on disk.

GALACTIC TRADER — NOW TRADE THE EMPIRE YOU HAVE CONQUERED

This program is a sequel to the popular Galactic Empire shown on page 18 of the catalogue. Peace has finally come to the war torn central Galactic system, which is now united into a single federation by the imperial forces of Galactica. Although we would suggest that purchasers of Galactic Empire would wish to buy this sequel, it is certainly not necessary to have had the original one in order to play the Trader. The idea of the game is that you pilot your rocket ship throughout the federation with the assistance of a navigator and Computer Central. The principles of trade are not difficult. The farther the product is from its world of origin, the greater its value. All one has to do is to buy or trade for cargo and take the products further from their home world to trade them for other commodities. In practice, of course, it is not quite that simple! You don't know the place of origin of the products, at least not at first, and nor is anybody likely to tell you! Until you develop experience on each planet, you do not know the rates of barter there and the locals will try to expoit you by fleecing you if they can. All your experience can be worthless if you are so incautious to ply one route too often, for the largest trading firms keep their ears open and they have the ''economic muscle'' to deal you out of any route that appears too attractive. Needless to say, there are many other problems which you have to overcome. For instance, you will find that no trader will accept the coin of the realm except on Galactica. Every other planet uses barter as the medium of exchange. Credits are only good at the fuel depot. Local rates of barter can be hard to understand. If a local trader thinks you are asking too much for part of your cargo, he may refuse to barter. That can be expensive if you have gone to the cost of bringing these goods to his doorstep! The most important cost consideration is fuel and the amount that you need will depend upon the mass of the shipping and the cargo, together with the distance to be travelled. Luckily the computer will give you assistance with these calculations.
There are many other points that you will have to consider, but the game comes with a good set of instructions on how to play, together with an additional page comprising the ''Ship's Manual''. Whether or not you have played Galactic Empire, you will enjoy the Galactic Trader, but as it may well increase the pleasure of the game to conquer the Empire, before trading it, we are offering a discount to customers who buy both programs of 10%. For both programs, therefore, the charge is £26.91. In order to be fair to the many previous purchasers of Galactic Empire (and upon proof of purchase) the cost to them of Galactic Trader will be £11.96. Otherwise the price in the price list is operative.

EMPEROR — TRY RUNNING THE ROMAN EMPIRE

Occasionally a game comes along which is of such immensity that it is almost impossible to describe. Such a game is ''Emperor''. It is entirely a game of strategy, played on a graphic map of the Roman Empire as it was in the first four centuries A.D. The player takes the part of the Emperor and he must pit his wits and forces against invading barbarians, rebellious provincials and treacherous Roman Generals. Even the Plebs of Rome will have to be placated with bread and circuses if the Emperor is to keep his head and his throne. If he can last out for the first eight years of the game, he is judged on the state of the Empire at the end of that time. There are three levels of play. Depending upon his choice, the Emperor has to guide the Empire through the first, third and fourth centuries. To win in the first century he must expand the Empire by two provinces, in the third he must maintain his Empire intact and in the fourth he must lose not more than two Provinces. For each Province the player is given three items of information, the number of loyal Legions, the number of revolting Legions and the number of Barbarian Invaders or Local Rebels. During play Legions must be raised, taxes inflicted and troops moved. The choice of Generals can be very critical — some are loyal and good fighters, some are neither. Battles must be fought and invasions repelled. All the while the citizens in Rome must be kept happy and — you must keep an eye on those Barbarians in Britannia!

TYPING TUTOR — ANOTHER PROGRAM FROM MICROSOFT

Typing Tutor does exactly that. It teaches you to touch type or, if you are already a touch typist, it increases your level of proficiency. Four levels are provided from beginner to advanced. The advantage of Microsoft's Typing Tutor lies in its exclusive ''Time Response Monitor'' system for monitoring the keyboard twenty times per second, which is four times faster than the fastest typist. The information received from TRM is analysed by the computer to monitor your skills and progress. TRM is so responsive that it can detect even a slight pause that occurs when you look at the keys instead of keeping your eyes on the screen. Thus, with Typing Tutor, you learn how to type the right way according to the touch typing method. The program keeps track of the keys you know, the keys you are learning and, of course, the keys you don't know. This knowledge is used to create completely individualized typing drills for increasing your speed and accuracy. These drills are based on the program's built-in vocabulary. Unlike text books or even oral typing teachers, this program optimizes your memorization process. You learn touch typing as fast and efficiently as your mind will let you! When you initialize the program, it tests you to determine your skill level and you are then given a chance of learning new keys or drilling for increased speed or accuracy. The interactive nature of the personal computer means that immediately following each drill, Typing Tutor tabulates the results. You know your speed, accuracy percentage, number of mistakes and even the keys with which you are having difficulty. Learning how to touch type on a Microcomputer is, when ones comes to think of it, a natural extension of the computer's use, particularly with the TRS-80, where the keyboard is so similar to that of a typewriter.

DSM – A RANDOM FILE DISK SORT/MERGE

An excellent new utility from Racet Computes available for the Model I and Model II TRS-80. DSM is a self-contained system written entirely in machine language ready for immediate use. It has the following powerful features: it sorts large files which may be contained on a number of diskettes on a minimum one drive Model II, two drive Model I disk system. Unlike other Sort programs, such as Racet's own GSF, this program physically re-arranges the records and no key files are required. The program sorts random files created by Basic including sub-records; in other words, if a buffer is split up into a number of logical records, this may be sorted as well. DSM sorts on one or more fields in both ascending and descending order; the fields may be either characters, binary integer, or floating point. Provision is made for optional output field deletion, re-arrangement and padding. The Sorting commands can be saved for reuse in production applications. DSM is ideal for large mailing lists, inventory control and other business applications. Sort times are very fast, varying from 33 seconds for 16K, up to 2,569 seconds for 680K. These times are for Model I 48K with four drives. Model II times are twice as fast. These times will, of course, vary with the types of sort and system configurations. One of the most important features of DSM is that it is extremely easy to use, and requires only a few simple commands for a given sort application. Various default values are provided for user convenience. As usual with Racet software, a full manual is provided.

SYSDMP – STORE BASIC PROGRAMS IN SYSTEM FORMAT PLUS VARIABLES

This is a very useful utility which will save a Basic program to tape in a form which can be accessed by the SYSTEM command. But it goes far beyond that, for it will also save the database being used by the Basic program, that is to say all current values of variables, arrays and strings together with the contents of the Stack. It will also save to tape (optional) the contents of the display at the time of the save. Finally, it saves any resident machine code programs. A Keyboard Debounce program is automatically included. A very important feature is that at the end of the dump to cassette, the computer is returned to the same state that it was in prior to the start of the dump and if the Basic program was running at that time, it will continue from the point at which it was suspended. When the tape is subsequently reloaded using the SYSTEM command, the computer is again restored to the state at which it was in immediately prior to the dump and the Basic program, with its database intact, will continue from the point at which it was originally suspended. If the display contents were included in the dump, the display is completely restored to its original state and even the cursor is reset to its former position. If the display contents were not included in the dump, then after the reload the screen is cleared and the cursor is positioned at the top left-hand corner. The usefulness of this utility is evident from the foregoing description, but one factor which may not be evident is that all System tapes are loaded with a checksum facility which, of course, makes sure that the load was successful. Basic programs do not normally carry out this checksum. It is hard to give a list of the applications of this program as they are so wide, but in general terms the user has the option to stop the running of a program and save everything to tape so that he may return at a later time and be able to pick-up exactly where he left off. One obvious application is the storing of lengthy games or application programs. There is now no excuse for staying up all night in order to complete the running of a particular program! Further applications that come to mind are in the debugging of Basic programs. Quite often a user is part way through debugging a program, but wishes to put the program ''to bed'' with the variables intact. This he can now do. SYSDMP is loaded as a System program itself and resides at the top of the memory. It only occupies about 500 bytes. Once loaded it can be called whenever required.

SYSTEM SAVERS – FOR SAVING SYSTEM FORMAT PROGRAMS

This package contains two programs, TDISK and FLEXL. They are both concerned with saving system format programs. The first saves them to disk and the second to tape. FLEXL is very similar to the program COPSYS or COP16K, which we already carry. It is, therefore, to a large extent a duplication. However, TDISK is such an excellent program that it makes this package well worth buying, particularly for customers using disks. One of the big problems in saving system format programs to disk is that a number of them overlap the DOS operating area in memory. In order to be used, therefore, they must be offset from this area. A number of programs carry out this chore with varying degrees of success. LMOFFSET, for instance, which is supplied with NEWDOS+, will offset the program, but does not carry out any relocation. Hence, although it is of assistance in getting the program onto disk, it does not help when it comes to actually using the software, unless one is prepared to do so in a Level II environment. TDISK is the only program that we have come across which (with all of the programs we have tried) infallibly moves a conflicting system program to another area and enables execution from that area. The Adventure tapes, for instance, have always been difficult to move, but TDISK seems to put them on disk and permit their being called from disk without any difficulty. The same remarks apply to Tandy Editor/Assembler and other programs including SARGON I. In summary, therefore, although FLEXL is a perfectly good program to use for making back-up copies of system format tapes, we are principally offering this package for the TDISK facility.

TELEPHONE INDEX – AN ADDRESS ETC. FILE SYSTEM

This program is essentially a dedicated disk data filing system, the purpose of which is to enable the user to file away on disk and thereafter access the following information: company name, contact, address, telephone number and a code. Full functions are included for creating, amending, deleting and searching records quickly and easily. An INSTRING function is used during the search, so precise spelling is not required. In order to read a record previously filed, it is only necessary to type the name of the company and the data appropriate to that company will be displayed. If more than one company exists with the same name, then a list will be displayed and the user is asked to make a selection. After the particular record required has been found and displayed on the screen, any part of it may be easily amended by typing in the new data. Records may be deleted. The search function is comprehensive and permits the user to use any of the fields in the record as a key. In other words, it is not only possible to search for all the Smith's, but also to search for, for instance, all companies in London. This is particularly useful when used with the code field, as a user can construct his own code and pull out any company on file with that code. It is possible for the user to change the field names quite easily so that the program can be made to fit his own circumstances, but if a customer has got this in mind, he might feel that the more generalized database programs shown elsewhere in the catalogue would be a better choice.

FINANCIAL ANALYSIS – A BUSINESS TOOL

This program enables businesses to handle their financial activities in an efficient manner. It carries out the following functions:

internal rate of return
present value of given cash flow
present value to future value and future value to present value
annuities from required present value
time span of payments

The program uses well-known business equations, which are available from any good text book and we will not go in to them herein. The program uses a rather unique method of memory management using a ''work sheet'' which contains the result of the latest computation or values input from the keyboard. After computation is complete, menu options allow the ''work sheet'' to be stored in a ''memory'' capable of holding up to ten sets of values. This work sheet can be listed or printed and also saved to disk. The ''memories'' are named (up to six characters) and can be given a reference number as well. For instance, a memory may be called MORTGE number one. On revision the reference number can be changed to two and so on. This ''work sheet'' method is extremely versatile and enables otherwise complicated calculations to be carried out with the least trouble. Another nice program from Nigel Dibben.

REGRESS — MULTIPLE REGRESSION

Multiple regression is a form of statistical analysis and is a method of estimating various unknown constants or parameters occurring in a function which relates to several variables. For instance, using Multiple Regression the eventual adult height of (say) a five year old boy might be quite well predicted with three variables such as present height, his father's height and his mother's height. A random sample of the heights of other five year old boys, together with those of their parents could be prepared and then some years later their adult heights measured. Then one would have sufficient data with which to construct a regression. The program uses a Matrix within which to enter the data to be correlated, the size of which is really only restricted to the practicability of the number of columns and rows. After the Matrix has been entered, it may be amended or stored on disk and a multiple regression calculation carried out on it.

SCRIPSIT A PROFESSIONAL WORD PROCESSOR

For some months now we have been awaiting eagerly the arrival of the new Tandy Word Processor for the Model I disk user. It has now arrived and at £69.95 is the best program for word processing that we have ever seen. In our opinion, it is far superior to any word processor on the market for the TRS-80 at the moment, including those which might cost considerably more. It is well nigh impossible to list all of its features in a catalogue such as this. It has around-about 100 different commands, many of which are quite new in the field. Probably the most important thing to emphasize about SCRIPSIT is its ease of use and ease of learning. For instance, it not only comes with a manual, but also three audio tapes on which are six lessons. Accordingly one is guided through the system literally by a commentator's voice. One of the problems of some word processors is that a number of different commands have to be remembered or looked up every time they are used. It is indicative of the thoroughness with which this program was prepared that some stick-on labels are supplied, which may be adhered to the front face of about 20 keys, so that the person who is using SCRIPSIT need not continually refer to the manual. But even if you do not wish to use the self-adhesive tabs, Tandy have supplied an ''instruction summary card'' which is easily kept by the computer or even in your pocket and gives a summary of all the commands. As we have said, it is not possible to go through all of the features herein. Pretty well any command that is in any other word processors for the TRS-80 will be found in the SCRIPSIT, including almost twenty formatting commands which, of course, includes right-hand margin justification. Three features that we particularly liked are as follows: 1. The ability to include comment lines which are visible on the display, but do not appear on the printed copy. This is extremely useful when later making alterations to format letters or other documents. 2. Extensive hyphenating facilities. This is a big advantage and enables one to hyphenate a word at the end of the line so that the text is not full of large, blank spaces. 3. The ability to exchange text. Not only is it possible to exchange words one for another, but the user can exchange paragraphs and blocks. It is often very useful to be able to swap paragraphs around in order to see the effect, without having to retype them in. We said earlier that SCRIPSIT is very easy to use compared to other word processors. Apart from the various matters that we have mentioned above, this probably comes about by reason of the fact that the bottom two or three lines of the screen are reserved for the exchange of information and instructions between the computer and the user. It is extremely handy to know exactly which commands are in operation or even called up. The line which separates the text from the ''command area'' also contains a very nice feature, namely that when you set the tabs which you require, these are shown by gaps in the separation line, in other words you can always see where your tabs are set and it is hard to think of a system which would be more simple to use than that.
SCRIPSIT is now available for all three of the Tandy machines, the Model I, II and III. It is compatible with the original Video Genie and the Model I and II Genie. With any of these Genie machines, however, a small patch is required. This is available either from us or from Lowe Electronics. The name of the patch is SPATCH and the cost is £5 plus 75p V.A.T.

Mr. Peter Page of 6A Shaftesbury Road, Brighton, Sussex BN1 4NE, has come up with a neat, little gadget to make the loading of any sort of tape easier. We are very pleased about this, because we have always maintained that it should not be necessary to pay $40 or $50 that some U.S. Companies ask for similar aids. It consists of a very small, perforated, veroboard. The specimen which he was kind enough to supply us with measures 7/8″ × 1-3/8″ and on the board are half a dozen diodes, a couple of capacitors and a resistor, together with a jack. A lead goes off the printed circuit board with a plug attached. The idea is that the plug which normally goes into the usual earphone jack of the taperecorder is plugged into the jack on the printed circuit board and the plug which is attached to the printed circuit board goes into the earphone jack. No power is required. We have used it a number of times and it has successfully loaded tapes we would otherwise have been unable to load. In fairness, we must say that there was one tape which it would not load even with this circuit, but it may well be that it was a corrupted tape. Mr. Page tells us that as a service to our customers, he will supply this aid for £6.95, inclusive of postage, if customers would care to send him a cheque.

MODEL II

Due to the kindness of Tandy, we were able to purchase a Model II early and we have now had some four or five week's experience on it. The purpose of this arrangement was so that we could have some software ready for the Model II when it was released in April. The following programs, therefore, constitute our first offering on software for the Model II. In much the same way for the Model I, we will be adding programs to the list with every new addition.

We would emphasize that programs mentioned below are actually in stock at the time that this list goes out. Programs upon which work is currently being carried out are Stock Control, General Ledger, Sales Ledger and Accounts Receivable. Customers may, if they wish, telephone to check on the progress of this software. The Stock Control, in particular, we expect to have very shortly.

We are also stocking blank 8″ disks for the Model II. These are single sided, double density and are priced at 10 for £39.95 + VAT.

We are also, at the moment, writing custom programs for the Model II and customers who wish us to do this, should write or telephone.

Programs, both machine code and Basic, and data files which are presently up and running on the Model I, can be transferred over to the Model II by way of the RS232 ports in the two machines. Thanks to the very kind co-operation of Peter Smith and his colleagues at the Tandy Bristol Computer Store, to whom we extend our grateful thanks, we have the facility for making the necessary transfer. Consequently, any customers who wish to have their programs or data transferred, should contact us for a quotation. We are doing this as a service to customers and the charge will be nominal and effectively will reflect the time taken in transfer. The two chief differences between the machines are:

1. The fact that the Model II requires the insertion of the word THEN in IF-THEN-ELSE statements.
2. The screen layout, which obviously has to be different on the Model II as it is an eighty character, twenty-four line display.

The transfer places the program or data into the Model II in the same format as it was in the Model I. Consequently, after such a transfer, some re-writing of the program may be required to fulfil the two conditions mentioned above. These modifications will be for

the customer to carry out, we will execute the transfer and supply the programs or data on an 8" disk.

We have had Green Screens made for the Model II. They blend extremely well with the machine and in our opinion are a great advantage to both the appearance and use of the computer. At this time they are the same price as for the Model I; should this change a separate price will be shown in the Price List.

PAYROLL — FOR MODEL II WAGES

On page 11 of the catalogue is described a disk operated Payroll for the Model I. This has been transferred over to the Model II and is now available with the following additional advantages:

1. National Insurance rates are now entered via the keyboard.
2. Tax return printout is corrected to 12 tax months.
3. The number of departments has been increased to five and full wages analysis is available at the end of each tax month.
4. The National Insurance categories have been increased from A-B to include retired and juvenile employees.
5. Following the printout of a P45, the whole employee's file is printed out.
6. Tax week 53 has been added as an option in week 52.

It will be noticed that the first of the above carries out the first half of our undertaking, that this program would be made compatible with Inland Revenue requirements, in that National Insurance and PAYE rates be capable of being entered from the keyboard. The second half, namely making PAYE rates adjustable from the keyboard will be following without charge in the course of the next two or three months, but in any event well before the Inland Revenue deadline of the end of 1980.

MAILING LIST — FAR BIGGER LISTS NOW POSSIBLE

Apart from speed the principal advantage of the Model II over the Model I is the increased bulk storage capacity, a ratio of about 4 to 1 for a maximum number of drives in both cases. It is therefore ideally suited for applications in which very large amounts of storage are required, such as mailing lists. This program is an adaption of the Mailing List described elsewhere in the Catalogue and contains all of the features listed therein. In addition, as far larger lists will probably be handled, a high speed sort program has also been incorporated. This sorts by surname rather than initials but assumes that the name is entered in the list with one initial followed by a full stop. Entities such as companies are sorted by the first name. Names in a mailing list may be accessed in one of two ways normally, either by giving each person a number which corresponds to the logical record number in the file or by the name itself. The advantage of the latter course is that it is not necessary to have numbers in the address or name. The disadvantage is a slower search. This is the system used in this program. The disadvantages mentioned have been overcome by way of the high speed sort mentioned — so that a master list of just the names together with the logical record number may be printed out by the computer for in-house use to which reference may be made for a name and thence the LR number — and (optionally) by splitting the list up into a number of sub-files which can be loaded into the core memory, so that fast access may be made to them by the persons name alone. Very high density lists should probably use the number key method, the disadvantage being that a degree of personalisation is lost in that the label must contain an often complicated number, which must be supplied back by the customer before his name can be found. A Mailing List program using this system will be available Mid-Summer. Disk capacity will depend on whether the user has more than one drive. Single drive customers will be able to store just under 3000 names and addresses per disk and multi drive owners will be able to store 3750 on disks in drives other than number 0. Assuming that it is reasonable to allow disk changing up to five disks per drive, total easily manageable lists will be 15,000 for single drives with 18,750 per drive thereafter.

UTILITY 1 — EDITOR/ASSEMBLER, DISASSEMBLER AND SUPERZAP

This is a composite disk which contains the above three utilities for the Model II. The Editor Assembler section is in fact a Model II disk version of the Microsoft Editor Assembler Plus for the Model I described elsewhere in the catalogue. The package includes a macro conditional assembly capability, in memory compilation and built in dynamic debug facility. The Disassembler enables disassembly into Z-80 mnemonics. The display may be continuous, or page by page, and will disassemble either from main memory or disk. The disassembly may also be printed out to a line printer if required. The Superzap utility is a modification of the one supplied for NEWDOS+ and enables the user to have complete access to the contents of the disk with the exception of track 0. The disk contents may be displayed or printed out to a line printer and modifications may be carried out to the contents of the disk.

UTILITY 2 — REPLACEMENT DEBUG ETC.

This software consists of eight separate utilities as follows:—

REPLACEMENT DEBUG: A replacement for the DEBUG program in Tandy TRSDOS. It features 35 separate basic functions plus 8 Edit commands. Single step and multiple step. Automatic trace of logic flow with trace printing and trace of instructions greater than stack pointer values, plus rapid trace. Subroutine call. Automatic program looping. Dynamic disassembly of instructions.

DIRECTORY CATALOGUE SYSTEM: This function builds a directory of directories. Sorts by disk or by program abbreviation or full form. Full form includes dates of creation and last update together with other directory data. "Wild card" select options with masks. A consolidation of directories and selection on file name and extension. Directory catalogue files may be saved and loaded and new data may be concatenated.

DIRECTORY FIX: Automatic repair of Hash Index Tables together with listing and flagging of directory errors.

EXTENDED COPY: This feature copies multiple files with a single command using masked select options. The source disk may be a non-operative system disk. All files may be recovered and invalid sectors itemised even though the copy continues. Files may be merged with or without replacement.

SUPERZAP: This feature is essentially the same as the one contained in the earlier utilities disk and in NEWDOS+ (page 12). It includes display, print, modify of standard TRSDOS diskettes. Full screen edit mode and automatic repeat scan and print. Disk sectors may be copied to the same or another drive.

DISK IDENTIFICATION: A utility to enable the user to change any disk identification.

EXTENDED CREATE: There have been some difficulties with the original Create utility in TRSDOS. These have been eradicated in this new version and the file may now be initialised to its end.

UTILITY 3 — INCLUDES SKRUNCH

This package contains the following utilities:—

ECHO: The purpose of this program is to allow the Model II user to produce a hard copy of all output to the video screen. The program attaches itself to the operating system, requires no user memory and intercepts each character as it is displayed on the screen, sending it also to the printer. Both serial and parallel printers are fully supported, as is the Spooler. The program may not, however, be used with the HOST program mentioned elsewhere in this list. The ECHO function may be turned off by running the program ECHOOFF, which is, of course, also supplied on the disk.

SAVE: The purpose of this program is to retrieve a resident Basic program following some kind of catastrophe, such as an accidental reboot or an unintended System command. Such disasters, of course, reboot the machine back to DOS. When this occurs, it is only necessary to type SAVE and the resident Basic program will be copied into a special file from which it may be recalled. Needless to say,

if the disaster caused pointers or other vectors to be destroyed, then garbage will generally be copied to the file.
SCREEN: This program allows the programmer to create hard copy of the video display on the printer. It is intended to be used as a subroutine for Basic programs and is loaded in DOS, but accessed from Basic. It changes from line printer into a screen printer in effect.
SKRUNCH: The purpose of this program is to reduce to an absolute minimum size a Basic program for optimal execution in the Model II. Programs which have been SKRUNCHed typically occupy 30% to 40% less memory space and run up to 10% faster. As Model II users will know, the machine frequently finishes up with a slightly less core memory space than the Model I. This program is of particular application, therefore, with the Model II. Optimising the program consists of five phases, all of which are optional, as follows:

1. Removal of all REM statements.
2. Removal of irrelevant blank spaces.
3. Removal of explicit type characters for integers.
4. Meging multiple statements into single lines.
5. Removal where possible of trailing quote marks.

It should be noted that feature no. 3 above will require the user to define his integers at the start of the program, and that all non integer variables should be explicitly defined. This is the only feature which is non transparent to the programmer, in other words requires some action on his part. As mentioned above, all of these features are optional so if the programmer decides there is little to be gained by using no. 3 it need not be called. Operation is from DOS, the command being SKRUNCHfilespec1 to filespec2 followed by the options required. The program to be SKRUNCHed may either be in ASCII or in compressed format. SKRUNCH will automatically make this determination. If SKRUNCH decides that the file is not a Basic program the user will be advised. The output file, that is to say, the one that has been SKRUNCHed will be in ASCII and most users will wish to resave it so as to automatically put it in compressed form.

GSF – GENERAL SUB-ROUTINE FACILITY

The Model I GSF is described elsewhere in the catalogue. The Model II version contains the following features.

1. An in-memory Sort routine, whereby several single dimension arrays of any type may be sorted into either ascending or descending order. A number of keys may be used at the same time and may be allocated sort instructions in either direction. Hence, one array may be sorted in an ascending direction, whilst another may be sorted in a descending direction, both at the same time.
2. Another in-memory Sort, this time for sorting a single string array. The advantage of this sort is that the user may stipulate the part of the array upon which the sort may be operated. A number of keys may be used and the location and length of the key may be stipulated. Hence, if one had a string array whereby each element consisted of four blocks of four characters, then any letter in any block may be stipulated as a key.
3. The Model II does not support the PEEK and POKE statements. GSF rectifies this by using the USR routines to POKE or PEEK a byte into the memory, and also to POKE a word as well. Hence, both bytes and words may be poked and bytes may be peeked. In both of the pokes, the previous word or byte is returned to the calling program. Two parameters are used in the procedure, the address to be poked or peeked and, in the case of poking, the new contents of the address required.
4. Compress the data. The purpose of this sub-routine is to compress a copy of any area in memory by eliminating repeated characters, such as (but not restricted to) blanks.
5. Decompress the data. Reverse of the above.
6. Move data blocks. This sub-routine will move data from one block to another. This is particularly useful for setting one array equal to another, moving data or arrays into protected memory and for setting all elements of an array to the same value.

IMPORTANT

There are a large multiplicity of different types of disk drives available for the TRS-80 and Genie machines. The most common numbers of tracks are 35, 40, 77 and 80. So far as actually reading and writing is concerned, the first two are compatible with each other as are the last two. The size of head is different between a 40 track and an 80 track and hence they are not compatible. We have elected to adopt the standard issued by Tandy, that is to say, 5¼" disks for the Model I have 35 tracks single density, 5¼" disks for the Model II have 40 tracks double density, and 8" disks for the Model II have 77 tracks double density. It is upon these standard disks that our programs are normally supplied. Non standard configurations can, however, be supplied at extra cost. For example:

Model I	40 or 80 track single density 35, 40 or 80 track double density
Model III	80 track single/double density 80 track double density double sided

The charge for any of the non standards is £5 plus £2.50 for the disk. It should be noted that this charge is simply for manufacturing the disk with or without a DOS on it. The terms and conditions at the end of the Index should be read for the charges for putting individual programs onto disks that do not normally reside there.
It is very important for users to be aware that the Model I TRSDOS is not capable of accessing track densities in excess of 40. Accordingly, if customers require a DOS on an 80 track disk they must show us that they own either LDOS, NEWDOS+ or NEWDOS 80. A stripped down version will then be placed on the disk for single drive owners, if requested. Customers who own more than one drive will have their software supplied on a formatted disk. Even so, we should be told what DOS is to be used to ensure compatibility.
LDOS is capable of supporting a multiplicity of track densities and configurations. With some very high densities it is important that the DOS used should be "optimised", in other words, that the System files, in particular, should cluster around the directory. It takes a comparatively long time on, say, an 80 track disk for the head to travel from track 40 to the inside track. If a System file that is frequently used, is allocated track 80, then the whole system can slow down quite considerably. The original LDOS disk, of course, is optimised, but customers who require optimisation or the supply of the more exotic densities and configurations should consult us.

JUNE LISTING

It's showtime again! Once again this year we will have a stand at both the Microcomputer 1980 Show and the Personal Computer World Show. The relevant data is as follows: —

Microcomputer 1980 Show. Wembley Conference Centre, Wembley, London.
22nd — 24th July, 1980. We will be on Stand 22.

Personal Computer World Show 1980. Cunard Hotel, Hammersmith, London.
4th — 6th September, 1980. We will be on Stand B19.

PINBALL — COMPLETE WITH FLIPPERS

This is an extremely good graphic representation of a normal pinball machine in so far as it can be represented on the computer screen. The usual arcade rollovers and bumpers are present and the flippers which guard the exit are particularly life like. A theoretical maximum of 299,990 points are available, but as far as we know, this has never been achieved. A good player will score about 30,000 and an excellent player will score about 50,000. The great ability of this program is that it has been written to give as close a representation of a pinball machine as probably is possible. For instance, on a real machine the ball is projected by a spring activated plunger. If the plunger is released at the maximum compression of the spring, the ball goes faster and vice versa. Such is also the case in this program. If the ball is ''released'' at the bottom of the plunger travel it will go faster than if it is released at the top of its travel. The ball will gain speed when it hits the bumpers and will decrease in speed as it ''dribbles'' down the side. Again as in the original, if the ball is hit by the end of the flipper it will gain more momentum than if it is hit at the base. A particularly lifelike feature is the fact that if the ball has a straight, unobstructed travel up the machine, it will gradually lose momentum and then gain it as it comes back down. Furthermore the ball can be given a spin if it hits obstructions at particular angles. All in all, an extremely lifelike simulation which really has to be played to be appreciated. A ''Bermuda Square'' appears from time to time without warning and if your ball happens to get trapped inside, it will ricochet from side to side and gain speed and points. Hitting various bumpers and lights, of course, give you varying quantities of points. Available on cassette or disk.

TRSDOS 40 TRACK PATCH

Tandy are now supplying Teac Drives instead of Micropolis, which are capable of accessing 40 tracks. We already, of course, supply NEWDOS for 40 tracks, but as an added service for our customers, we have executed the necessary patches on TRSDOS and any customers who sends in an original Tandy 2.3 or 2.2 TRSDOS disk, may have it re-recorded by us for a nominal charge of £5.00, including VAT and postage.

SOUND — A MACHINE LANGUAGE SUBROUTINE

This is a very simple, but nonetheless, useful and interesting program which is loaded into the top of memory and then called from any Basic program. Use of this subroutine enables a programmer to create essentially any sound to give more dramatic effect to his Basic program. Six parameters may be set as follows: —

1. To determine the initial frequency of the sound, i.e. its pitch.
2. To set the duration of the tone in time.
3. To set the number of times that the tone is to be repeated.
4. To set the first change of tone.
5. To set the second change of tone.
6. To set the third change of tone.

In order to enable the purchaser to get an idea of how the subroutine should be used, a short Basic program is included on the tape by which the user can choose the various parameters mentioned above and listen to the resulting sound. Obviously, a sound box has to be connected to the larger grey plug going to the cassette in order to hear the sound. We have, incidentally, received a number of queries about sound boxes. A sound box is any simple amplifier. We have available free, a circuit diagram of one such suitable unit, which only uses one integrated circuit and a couple of capacitors with a speaker. Alternatively, almost any pre-built transistor amplifier can be used and these are available at most electronic hobby shops. So far as we know the requirements are completely uncritical and we know of one customer who ''plays'' his computer through his hi-fi system.

CHEQUE BOOK — A SIMPLE APPROACH TO HOME FINANCES

The Home Budget program (page 24 of old style catalogue) was extremely comprehensive and therefore, in some respects, moderately complex to use. This program, on the other hand, is very straightforward and yet we feel gives the average customer probably most of what he would need in managing his finances. The program is divided into four parts. The first is a cheque book account which allows a maximum of 100 entries per file. Options include adding debits and credit, reading current data, making alterations, recording a new data file, reading a data file and it essentially maintains a running bank statement. The actual display is split into four headings of item, debit, credit and balance. As entries are made, so the balance is changed. Existing data may be stored either on cassette or on disk. The second part carries out mortgage calculations and supplies the usual information as to monthly payments, interest and tax gain per week or month. This information may be displayed either as a continuous table or as a summary. The third section of the program is concerned with investments. It asks for the investment amount, the interest rate and the period and supplies the amount at the end of the investment and the total profit that will be made. The final section is designed to calculate the investment potential of regular monthly payments into a SAYE account. Input is the monthly payment interest rate and expected term and the program caters for single persons or a married couple. All in all a nice, compact, straightforward program.

MUSIC MASTER — AN EXHAUSTIVE MUSIC PROGRAM

This is a fascinating program for those of you who are musically inclined. There have been a number of music programs written for the TRS-80, some just to convert the keyboard into a piano or organ and some which help music to be composed. This program combines all of these facilities into one program. In addition, some excellent graphics are provided of representations of a piano keyboard and a

stave. Obviously to get the most from this program, it is necessary to have a sound box connected to the auxiliary cassette plug. The program is broadly divided into four parts and we will deal with them separately. The first part which is called ''Music Master'' calls upon the user to input a chord or note. When this is done the computer will play the note through the sound box and show its position on the keyboard and a stave display of it. A chord may be entered after the note. In addition to the above, various items of information are supplied with regard to the note which has been entered. These include the relative minor, the number of sharps or flats, the notes affected, the dominant 7th and the dominant 7th of minor. Incidentally, it may be convenient at this stage to say that if any of this description does not make too much sense, it does not in any way reflect on the quality of the program or the skill of its author. Merely a lack of knowledge on our part! The next section of the program is concerned with the composition of music. The graphic display of the keyboard is overlaid with various letters and the user is called upon to enter his composition. After completion it is displayed and played on the sound box. Full control is provided for note duration and pauses. Once the tune is perfected, it may be recalled at any time and may also be permanently included into the program. The third section, video master, is itself divided into two. The program comes with five tunes already programmed into it. These may be played on the sound box and will be displayed on the screen. The second section gives the user the ability to convert sounds going into the recorder either from its internal microphone or from an external source plugged into the AUX jack into a graphic display. The program provides for fast transposing from one key to another. As can be seen from the above, this is a very comprehensive program and is available on tape or disk.

LIFETWO — A NEW APPROACH TO AN OLD COMPUTER GAME

This program actually consists of two games. The first is essentially an original Life. It is played on a 62 × 42 grid. The number of generations may be chosen. The speed is about 100 generations per minute. The usual rules of generation apply, namely survival for a life unit with two or three neighbours, death otherwise. Birth is granted for an empty position with just three neighbours. There are probably two features which set this first version of Life apart from some other similar programs. Firstly, that the life cells are positioned on the array by using the cursor arrow keys and secondly, at any time during the progression of the generations the game may be stopped and new life units inserted or, for that matter, existing ones removed. The second game of Life in the program essentially combines life with graphics and it is this part of the program which provides sound. This version of Life may be played by any number of persons up to four. Each player enters six of his life units in a 5 × 10 array. When the game is started the usual rules will apply, except that birth goes to the majority life form. After each five generations, play is stopped and each player with existing life forms may enter two more. The battle between the four life forms continues until only one is left. During the contest a truce may be called and changes can be inserted. The graphics come into the program in respect of the life forms. In most games of Life, these are represented by a dot on the screen. In this one, life form 1 is represented by a graphic picture of a little man who occasionally talks and stamps his feet. The second by an octopus (but with only four legs!). The third by either a being from another planet or a mutant, as the character has two heads and finally, the fourth, by what we can only call a being. All of these little chaps squawk away from time to time, moving their heads and moving their limbs, again reminiscent of the androids in Android Nim. In summary, this program contains a serious approach to the game of Life and what we are sure the authors intended to be a rather fun approach.

VIDEO GENIE

As I am sure you are all aware, the Video Genie is now with us. First shipments arrived shortly after the last list went out, I believe. The only software incompatability between the Genie and the TRS-80 Level II is the absence of the Clear and righthand arrow keys on the Genie. We have about a dozen programs which use these keys, which are in the process of being changed now. Customers, when ordering for the Genie, should always state that that is the machine they intend to use for with these dozen or so programs a different version will be supplied.

At the moment, the Genie is only available in the 16K ''Level II'' version. Hence, all programs that are so marked in the price list and index will run on the Genie. If we import any programs in the future over which we have no rights, which are not fully compatible with the Genie, we will mention this in the sales literature.

Finally, it should be remembered that some programs are either enhanced by, or are totally reliant upon, a sound feature. This is not easily available from the Genie at the moment, but Lowe Electronics, the importers, are working on it and it may well be that at the time this list is out, they will have some definite news.

"TRS-80 DISK AND OTHER MYSTERIES"

This is the much heralded book by H. C. Pennington. It is a good book but there are one or two reservations which we feel should be made about it. First of all, although the title says ''and other mysteries'' this is essentially a book for disk users. There are some comments relevant to the tape user but they are few and far between and certainly do not warrant its purchase. Secondly it is almost entirely orientated towards Newdos+, if you have the straight Newdos, without the utilities and particularly Superzap, or you use TRSDOS then the value of the book is lessened considerably. Finally, it is a book for the specialist user who has a large interest in the inner workings of his disk system. Subject to these reservations it is of very real value in explaining the intricacies of the method in which data is stored on the disk and in particular the disk directory entries. Unless you have worked it out for yourself, the book is probably indispensable if you want to know how to save corrupted or killed files. The disks are discussed from the point of view of the user with such interests, not from the viewpoint of the programmer or one interested in the mechanical and electronic aspects of the drives. We have stocked the book for a couple of months now, it just missed the February listing, and a number of customers have been delighted with it. We thought however that we should mention the reservations which we had on first reading it.

In a recent edition of ''Practical Computing'', a program appeared written for the Pet called ''Sheep Dog''. Mr. P. Page of Brighton converted this over to TRS-80 Basic, but unfortunately we have been unable to obtain permission to publish the program. We feel that it is a fascinating program and deserves to be disseminated. As we cannot publish it and with Mr. Page's kind permission, we are supplying a listing of the converted program free to any customer who sends in a large stamped addressed envelope for 15½p.

OWL TREE — OWLS AND BATS

This and the program following are very reminiscent of the graphics of Android Nim and Beewary and like them, provides a sound facility. Needless to say, the graphics are extremely good, but the game is so weird that it is hard to describe. It starts with a graphic representation which almost fills the whole screen, of a tree. On that tree are nine positions and when the game starts, they are occupied by eight owls and one bat. The bat hangs rather horrifically upside down from the branches. The object of the game is to get rid of the

bat and fill all nine positions with owls. When you shoot the bat it will disappear and be replaced by an owl. Unfortunately your shot has scared away other owls which are rather unfortunately replaced by bats. Throughout the game, the removal of one species will result in its replacement by its opposite. It is most inadvisable to shoot owls by the way. When you start the game you can specify the position of the bat as either at the centre, a corner, a side or random on the tree. Whilst we are not at all sure that we agree with the basic concept, namely that bats are bad and owls are good, there is no doubt that this game is both frustrating and enjoyable.

BASIC COMPILER — USE A COMPILER RATHER THAN THE INTERPRETER

The advantage of a compiler over an interpreter is, of course, chiefly one of speed. The Microsoft compiler will run Level 2 Basic programs at an average of 3 - 10 times faster than programs run under the interpreter. Extensive use is made of integer operations which result in twenty to thirty times faster operations than the interpreter. Probably the most important feature of the Basic Compiler is that it achieves these speeds in Basic, the language which most programmers already know. The program compiles the same source code with your current basic interpreter and therefore adds speed with the mimimum of effort. Features in Microsoft's new version of 50 Basic interpreter are included in the package. Features like the WHILE . . . . . WHEND, variable names, variable length records and the CALL statement all make programming far easier. An exclusive Basic Compiler feature allows the user to call Fortran and machine language subroutines much more easily than in Level 2. The Compiler is used by simply typing in and debugging the program as usual using the existing basic interpreter. A command line is then entered instructing the computer what lines to compile and what options to use. The result is a highly optimised Z-80 machine code that the TRS-80 executes in far faster time than heretofore. The compiled program can be run and/or saved for later use. It is saved on disk for direct execution. For people who are writing programs for commercial distribution, the Basic Compiler is a very useful tool as it is only necessary to distribute the object code, not the source which stays fully protected. The Basic Compiler runs on TRS-80 Model I with a 48K memory and a disk drive and the package includes the compiler, a loader and basic library, complete with documentation. Microsoft royalty information for the sale of programs compiled with this Basic Compiler are available from us.

muMATH — A SYMBOLIC MATH SYSTEM

This system extends your TRS-80 beyond the limits of numerical evaluation to a much higher level of mathematical sophistication. The power of muMATH is its symbolic mathematics. For the first time algebra, trigonometry, calculus, integration, differentiation and more can be performed on a system smaller than the IBM 370. Furthermore, of course, it is done in a minute fraction of the time that it would take to do it manually. There are a number of examples that we could give, but unfortunately most of them would use characters not available in print. A simple example would be that if you type on the computer ?1/3 + 5/6 + 2/5 + 3/7; the instantaneous answer will be provided of 419/210. MuMATH has virtually infinite precision with full accuracy to 611 digits. We only recommend this program for customers who are using mathematics frequently and if you are, then muMATH will save you a great deal of time and effort. It is essentially a professional tool for engineers, mathematicians and scientists and a learning tool for students at any level from algebra to calculus. Also included in the package is muSIMP, the programming language in which muMATH is written. This is a superset of the language LISP. MuSIMP is designed especially for interactive symbolic mathematics and other artificial intelligence applications. In addition to muMATH and muSIMP, a complete manual is included and this software requires 32K and a single drive.

MORSE CODE COMMUNICATOR — A SOFTWARE APPROACH

This is a fascinating program that will not only have application for radio amateurs, but also for any shortwave listener who has always wondered what those funny dits and dahs mean that come over the various shortwave bands. Indeed it is perfectly possible with this program to decode the Russian news service, TASS. Not having done it we are not quite sure whether or not one needs a knowledge of Russian. But there are a great number of transmissions on the air waves which are in morse code and to be able to read them is quite a fascinating pastime. To the best of our knowledge, previous approaches to this subject have been by way of hardware interfaces. This program takes an entirely software approach and all inputs are through the black EAR lead and outputs through the grey AUX lead. Input or output may be from or to a receiver transmitter or straight from tape. The interfacing between the computer and the receiver is through the cassette recorder. Probably the easiest way is simply to hold back the record inhibit lever on the recorder, press the play and record buttons together and remove any microphone dummy plugs. The internal microphone in the recorder is thereby activated and any morse transmission which it picks up will be processed. This is probably not the best method as there is almost bound to be background noise and the preferred system would be to simply connect a lead from the radio to either the AUX or MIC (depending on strength). A further method would be to plug the black lead which normally goes into the EAR socket into the ear piece socket on the receiver. You must when using this system, however, be certain that the receiver output is an ear piece type. There are a number of other methods including simply tape-recording the transmission and playing it back through the recorder. So far as output is concerned, generated morse is sent from the computer through the grey AUX lead and this may be used either to make a tape-recording for later transmission or output it directly to the transmitter. Obviously we cannot go into too many details of this as it will depend upon the type of transmitter being used. Various notes are contained in the documentation accompanying the program which enable the pitch of the output to be changed to suit various transmitters. Essentially the program is a morse code generator or decoder with input and output in English. Maximum speed in either mode is 28 words per minute and all morse shorthand is supported and correctly displayed. Other features include variable speed on transmission/generators of morse code either direct from English inputting from the keyboard or by typing a full screenful whereupon the entire page will be generated at one time.

GOMOKO — AN ANCIENT ORIENTAL GAME

We are not too sure of the origination of this game. It is, in some ways, very similar to the Chinese game of GO and it is played on a similar board. On the other hand, it also has some similarities to Othello. The author, Dr. G. Shafto, who also wrote the Draughts program in this list and mentioned elsewhere in this list, says it is an ancient, oriental game and he should certainly know! Anyway, the game is played on a rectangular grid, the size of which may be chosen by the user. The maximum size is 20 wide by 14 high. Tokens are placed on the grid by the user and the computer in turn, and the first player to get five of his tokens in a row is the winner. A simple game perhaps, but fascinating to play and greatly enhanced by the feature of being able to choose the size of board. This is a Basic program for 16K tape or disk.

DRAUGHTS — AN EXCELLENT COMPUTER VERSION OF THIS POPULAR GAME

For some unknown reason there have not been any really good draughts games for the TRS-80. There have been one or two "Checkers" in the States, but the quality is not as good as it could be. This version contains excellent graphics. The board, in fact, is almost identical to that used in the Sargon Chess game. All of the standard rules apply, including Huffing and Crowning and six levels of play are supplied. So far as we can see, the computer is almost unbeatable at the highest level. A particularly interesting feature of these levels is that if particular levels are chosen, the computer will play a very aggressive game, taking its opponent's pieces almost regardless of the future strategy. Particular attention has been paid by the author to the end game and, all in all, it is a very enjoyable computer game. It has general appeal, but perhaps the emphasis will be upon those users who want a strategy game similar to Chess, but who do not have the amount of time that a good computer Chess game requires. The program is, of course, written in machine language and the computer response time varies from one second to eighty seconds, depending on the level of play chosen. Incidentally, levels of play can be changed during the game. Two further features of this program are that it is possible to set up specific board games for consideration and it is also possible to cancel a previous move. Available on cassette for 16K or more Level II and on disk for 32K or greater memory size.

POOLS — TRY YOUR LUCK

Life is so serious in business these days that we have to start the description of this program by making a disclaimer of liability! Neither we, nor the author, in any way, shape or form warrant or suggest that the use of this program will win you a fortune on the football pools, or indeed will win you anything. We would, however, suggest in all seriousness that it will probably increase your chances. The program forecasts the likeliest results based on the current team points to be found in the football league tables. Using these tables, plus some bias, the program will forecast the likeliest draws, home or away wins, depending on which type forecast you require. We mentioned "bias" because the program enables the user to enter a bias factor based upon his own judgement of current events. If, for instance, a well known goal scorer for one side has broken his leg and will not be playing, a suitable bias may be entered. It is entered on a scale of 1 to 9, which will be represented approximately by the values shown below: —

DOWN		UP	
No.	%	No.	%
4	-5	6	+5
3	-10	7	+10
2	-20	8	+20
1	-50	9	+50

The entry 5 is equivalent to par performance and need not be used, for if no number is entered, then no bias takes place. Entry of the teams and their points is, of course, somewhat boring, but it has been made as interesting as possible with a nice, neat, graphic display and the user has a number of options to make corrections and list the matches. When the match entries have been entered, the user may call up the most probable results, i.e. a draw, an away win or home win. He may also call upon the computer to calculate and read out the most likeliest draws. The final alternative is to calculate and display four draws, twelve homes and six aways. An interesting program, the seriousness or otherwise of which can only be shown by a substantial win.

IMON — A NEW MONITOR

As we already stock four Monitors it may well be asked why we should stock another. The answer is that this one has rather different features and applications to Monitors 1 - 4. They are compact Monitors aimed at users who wish to use a Monitor in conjunction with Basic programs, or at least with the capability of loading both the Monitor and a fair sized Basic program into memory at the same time. IMON is aimed more at the machine language programmer who only needs 3 or 4K usable memory (in 16K machines) in addition to the Monitor but who requires some additional commands, particularly applicable to machine language programming. In the following list of IMON commands therefore, the emphasis will be on those commands which are present in IMON but not in Monitors 1 - 4, which are marked with an asterisk.

1 ASCII display of memory. What we find an attractive feature is that a line feed is used as a terminator for the display line, thus making the display more readable.

2 * Set Breakpoint. This feature is not supported in the other Monitors. Up to three are supported. The effect is that when the breakpoint is encountered, execution of the machine language program being executed is stopped and the registers are displayed, as is also the address at which the halt was made. Probably this is the most important feature if IMON as such a facility is invaluable in debugging. Although one can always use as many breakpoints as are available, the support of three in this program is generous. TBUG for instance, only supports one.

3 Write ASCII direct into memory. Characters from the keyboard are edited direct into memory.

4 Disassembler. A straightforward disassembler to Z-80 mnemonics.

5 Edit memory.

6 Filler. Changes any stipulated memory block to a given value.

7 * Go with registers to last breakpoint and continue. Used in conjunction with the breakpoint feature described above.

8 * Printer set up. This command enables the printer for output from the Monitor. An important feature is that both parallel and serial printers are supported. A serial printer must be connected through the Tandy 232C board and it is assumed that correct switch positions are set up on that board. Thus the Monitor interfaces a software serial driver routine with the hardware selected functions.

9 Input utility. Inputs from cassette. One of the features of IMON is that an automatic or direct start routine may be recorded on tapes made by the Monitor (see below). The input utility therefore asks whether or not the tape to be inputted was made by the monitor and, if so, whether the automatic start should be overridden.

10 Jump. Jumps to a specified address and executes.

11 * Load data from tape to a buffer. Another useful utility. Input from the tape is loaded to a specified buffer area in memory, rather than to its normal location. All data is loaded after the sync byte, including block identifiers and checksums.

12 HEX display of memory.

13 Output utility. Makes a tape of any required program in memory. The important feature is that an automatic execution trailer may be (optional) recorded onto the tape, the effect of which is that when the program is reloaded under the basic System command, it will execute automatically without the second asterisk appearing.

14 * Print speed. Valuable only with "non-Tandy" printers. A little clumsy in operation.

15 Printer set up disabled.

16 * Register display. Of great value is the ability to display the contents of the registers. The stack pointer is included.

17 Search routine. Search a specified block of memory for a specified byte or bytes.

18 * Port Control. Another new and useful feature. This routine continuously scans and displays, the contents of all the 256 ports at the same time, on either the screen or printer. Furthermore any byte may be sent to a port.

19 * Verify. This routine verifies a block of memory with a tape. The tape must have been created by IMON.

20 * Write tape from a specified buffer.

21 Mover. Moves a block of code from one location to another. It is important to note that this function does not relocate in the sense of changing any addresses of operands. It simply takes a block of code and puts it in a different location.

22 * Edit absolute branches. A final useful function not found in many other monitors. It carries out a disassembly but when it reaches an absolute branch, the program halts to give the user the opportunity to alter the branch address, whereafter the disassembly continues.

A very nice monitor with only a couple of small criticisms too trivial to mention. If you need a monitor then the choice between this one and the others will be easy. If you are interested in machine language almost exclusively, then buy this one. If you need to interact with Basic as well buy one of the others. Note that where an asterisk does not appear above, the functions may not be exactly the same. Monitors 3 and 4 for instance can punch a tape but not put an auto start trailer on it.

COMPANY DIRECTOR — AN ALTERNATIVE TO CORPLAN

As the functions of this game are very similar to those of Corplan there will obviously be comparisons, so we will deal with these first. The main one of course, is price. Corplan is considerably more expensive but it should be borne in mind that it is marketed in a very nice binder with high quality paper. Company Director is supplied with full instructions but on normal paper and with no binder. Corplan is also aimed at least in part, at the educational market, for the instruction of trainees, whilst Company Director is a straight game which may or may not have educational overtones. Company Director is concerned with the management of an electronics company which has the capability of producing up to 6 different products — Colour TV, Refrigerator, Video Recorder, Digital Watch, Portable Radio and a Music Centre. Any number of players up to four may take part. In Corplan when a number of players play, each takes the part of a director on the board of the one company; in Company Director each player has his own electronics company, which produce the same products in competition with each other. Hereafter when we speak of ''the company'' we refer to either one company for one player or each individual company if more than one play. The company starts with an authorised capital of £10 million (or rather $ as there is no pound sign) of which £5 million is issued at the start of the game and allocated to plant, machinery and cash. The remaining capital can be issued throughout the game or finance can be raised by way of an overdraft, which of course incurs interest payments. The game is split up into decision periods of one month during which each player has the opportunity to manage his company by means of a range of options involving labour, sales, machinery, plant, overheads. It is with these decisions that the skill of play is concerned. Make the correct decisions and the company will prosper, buy too much new machinery with too little labour to operate it and you will have problems. Heavy expenditure on Research and Development will yield benefits in the long term but not immediately. All of these factors are inter-relative and a full explanation of their effects is beyond the scope of this write-up. They are of course explained in the instructions. In addition to normal home market sales, opportunities will come up during the game for the players to bid on large export orders. If more than one player is playing, these bids will be competitive and are made in secret. Normally the lowest tender will be accepted but it will have to be below an undisclosed figure set by the buyer. A penalty is payable for non delivery on time and the order will be cancelled, leaving the company with unsold stock. Obviously production and labour will have had to be adjusted to meet the export order. At the end of each month, the computer calculates the results which are displayed in the form of a Profit and Loss Account and a Balance Sheet. A rather nice feature is that at the end of each month graphs are displayed for sales, net profit and a cumulative net profit. Cumulative accounts are also displayed at the end of each year. In summary, an interesting and captivating game, the appeal of which is enhanced by the graph feature (which in all fairness is probably not very informative but certainly adds punch to the game) and the competitive ingredient, when more than one player plays. The latter incidentally, gets very interesting when one player operates two companies and one can compare the effects of different inputs. Some features are randomised so the results are not always what one would expect!

GALACTIC REVOLUTION — A FOLLOW ON TO THE OTHER TWO GALACTICS

This program follows on the action from Galactic Empire and Galactic Trader. All three are space strategy games, the idea being that in the first the theme is war, in the second, trading after peace has been declared and this one a revolution. Actually Revolution rather combines the features of its predecessors. The game may be played by one, two or three players, each taking the part of a character in the game. In the last list we offered a discount for the first two Galactics. This is now getting too unwieldy and we must revert to the prices in the price list henceforth.

NEWDOS+

The original NEWDOS+ is a remarkably bug free piece of software, but from time to time small corrections have been suggested by Apparat. With one exception (a correction to the renumber routine) these corrections have been so inconsequential that we have done nothing about them. Now, however, it has been found that NEWDOS+ has certain incompatabilities with the Tandy lower case modification and also with SCRIPSIT.

In accordance with our policy of supporting completely the software that we sell, it is now time to update NEWDOS, especially as there is also a new version of Superzap. This is a big job because there are a large number of copies of NEWDOS sold; we must make one thing abundantly clear, we are only able to update NEWDOS disks which we have sold and which bear our serial number label.

The update takes two forms. Firstly, there are those which Apparat call mandatory and which are necessary for the correct running of the system. Other alterations come under the heading of optional. These are changes which may, or may not, be made and do not affect the running of the system as such. An example of an optional change is to permanently disable the debounce routine. Another is to correct the mis-spelling of the original author's name.

We propose to carry out the updates in two ways. So far as mandatory alterations are concerned, a customer may send to us his original serial numbered disk and we will re-record an updated version of NEWDOS on it, which will include all of the mandatory alterations to date and also the new version of Superzap. Secondly, we will provide, with that updated disk, a list of the optional alterations which the user may, or may not, zap onto his disk himself. On this sheet will also be included various notes which Apparat have issued, including instructions for the use of the three or four new functions of Superzap together with updates to other programs such as Microsoft's EDIT and Tandy's SCRIPSIT will also be included.

Regretfully, we have to make a charge for this service. Apparat themselves charge $10 for Superzap alone — leaving it to the customer to carry out the mandatory alterations. It therefore seems fair if we make a charge of £7.50, plus 75p. postage and packing. We will do everything we can to return these disks as soon as possible, but we expect to receive a large number, so our normal return of post service will, on this occasion, probably have to be extended.

Needless to say, the disk which you send to us must be in good condition. If it has been damaged in any way which makes it unrecordable, it may still be sent, with an additional £3.00. We will then record on a new disk and return it.

DSM — A RANDOM FILE DISK SORT/MERGE

One or two small bugs in early versions of this program, which is available for the Model II and the Model I, have been corrected. We do not think that we received any of the ones with the appropriate serial number, but any customer who received a Model II disk with a serial number less than 3,000 should send it back to us for a free up grade. All Model I disks were upgraded before shipment. Incidentally, although the description of what this program does, as shown in previous pages, is probably a little complex, the actual use of it is extremely simple and is made even easier by the use of CMF files as described under the literature on COMPROC on page 5. It is, therefore, one of those very good programs which carry out complex work in an easy manner.

MODEL II

A lot of Model II software is still in the throws of preparation. Additional new programs are listed below. Tandy have now issued their Inventory Control and General Ledger for the Model II and both are available at the price of £129.95 each, including VAT.

The Inventory Stock Control provides coverage for 3,000 stock items and includes review of the current inventory status; extensive editing and maintenance option; a master file listing; normal ordering and receiving facilities with automatic updating; easy to use sales posting; the printing of sales transaction reports; inventory performance reports and a code analysis; complete vendor listing is available with up to 200 vendors; inventory worksheets are provided.

The General Ledger provides complete facilities for up to 504 accounts; user defined numbers; automatic out of balance; automatic entry totalling and document balance; seven optional expense categories; up to 50 entries per document and 300 documents per month; well defined audit trails; printouts include a chart of accounts, trial balance, document listing, posting summaries, ledger detail report, profit and loss statements and balance sheet.

IMPORTANT

We are all working extremely hard, of course, on producing software for the Model II and all of the items in the last list have been available for some weeks. However, we should mention, as we have prided ourselves in the past on having everything in our catalogue in stock at all times, that this state of affairs may not always apply for Model II software in the first two or three weeks of its introduction.

BASIC REFERENCE — PLUS A BIT MORE

One of the most useful utilities a basic programmer can have, in our opinion, is a cross reference program. Indeed, we think that this is one of the principal features of NEWDOS+ (page 12, item 6). This utility for the Model II extends the normal reference program and carries out the following functions:

Searches for and displays on the screen or lists to the line printer all line numbers which contain:

1. All variables.
2. Specifically named variables.
3. Specifically named integers.
4. Specific commands or statements such as ''GOSUB''.
5. Specific strings up to 12 characters in length.

To further clarify, with this utility it is possible to search an entire Basic Program for the occurence of the above listed items and to display on the screen, or list on the line printer, the line numbers in which they occur. As can be seen, it is therefore an extremely easy exercise to find where variables are used, find what variables are used, trace back GOSUBS and GOTOS, and find the occurence of pretty well any string. The usefulness of this utility cannot be over emphasised.

A TRAILER

The Typing Tutor from Microsoft has proved to be far more popular than we anticipated. There seems to be an immense amount of interest in typing instruction programs. One of our authors, therefore, is writing an extremely comprehensive one consisting of about eight lessons and this will be available in our next list.

A WORD ON OUR CATALOGUE

Customers frequently ask us about the quantity of space that is allocated to each program and we would like to make it clear that the number of lines of description of any particular program in the catalogue in no way reflects the quality or complexity of the program. It is simply that some programs require a lot of explanation and some very few. A Wages program, for instance, is extremely complex, but there really is not too much you can say about it except that it calculates your PAYE and National Insurance. A good game on the other hand, not perhaps of the seriousness of business programs, may well still need a great deal of explanation. Experienced readers of these sheets may be able to gather from our description whether we are particularly taken with a program, but as the judge says when he sums up, this should in no way affect your decision! The important point is that we always try to give a fair representation of the program and what we think of it.

NEW TAPE FORMULA

One of the problems of the TRS-80 has always been the loading of tapes. It has been known for some time that the principal difficulty is the tape itself, which requires a particular quality of base, load of oxide and resulting frequency response. Tape usage has now grown to such proportions that we have been able to have a tape made to our own specification to suit the TRS-80 more precisely. Again due to our increased buying power, the price to us has not increased, hence we are maintaining our pricing schedule for blank tapes and for tape programs.

Whilst on the subject of tapes, we have had some feedback from customers, particularly commercial users, regarding the labels that we issue free with blank cassettes. Originally we had completely blank labels, but when we had our own printed up about eighteen months ago we started to issue them. However, some commercial entities required to put their own name on so we have now reverted to the original arrangement of supplying completely blank labels.

NEW AUTHORS PLEASE NOTE

As this June list goes to press, we are concluding negotiations in the United States for the distribution there of some of our English authors' programs. We are also in the process of negotiations for distribution in Australia. These new activities will make more profits for our authors and, before anyone asks, no it does not make a great deal for us but it will, we hope, attract more and better software from authors.

HINTS AND TIPS JUNE 1980

A rather mysterious one to start with. Non existent syntax errors have always been known in the TRS-80 and can be a symptom of hardware faults but over the last few months we have seen error statements, not necessarily syntax, appearing repeatedly in highly complex programs where very tightly nested loops occur. They always seem to come about when all of the NEXT statements are together and only one NEXT is actually used. Assuming that two loops A and B have been called, they may be terminated either with NEXT, A,B or with NEXT A:NEXT B. It is the former which seems to get mixed up and usually when there are three or more loops and the code is written very compactly. I have nothing definite as yet but would be interested to hear from anyone who has had similar experiences. If it is a fault it is not a hardware one as it occurs on different machines. Most Model II users will have found it by now but if they have not, a small bug exists which results in the inability to SAVE password protected basic programs. Tandy have it in hand and a patch will be issued soon. As you can imagine, we are often led a merry dance with obscure bugs in author's programs submitted to us but one (and the author shall remain nameless) added a few early morning hours to my day recently. The program would run normally and then suddenly I would get a syntax error in a particular line. On examination I found an INKEY$ statement in the line so I took it out, cursed the author and pressed on. Five minutes later up it came again, and again, and again. To cut a very long story short the author had left a POKE statement in from a previous version. As the program poked a machine code routine in. It was not readily apparent. The POKE was 201 which is an RET in m/c but is also the token for INKEY$. The moral is always watch your POKEs! Heard a lovely story from Allen Greenhaugh the other day. He resigned as a Tandy manager some time ago to set up on his own. He got a number of complaints from a customer about a printer problem. In the end he went to the customers' premises and noted that the plastic ''doors'' on the interface were off, regardless of whether an edge connector was in place. So he opened up the interface to find a mouse nest inside! As he told it to me the mice were living underneath the circuit board and using the top as a table for their food. Moral again, always keep your doors closed! It is a compliment to Tandy workmanship that the printer fault turned out to have nothing to do with the stowaways! Not sure whether I've mentioned this before - if not I should have. If a REM follows a GOSUB or GOTO neither REM nor an asterisk is needed. Try:

```
10 GOTO 20 COMMENT COMMENT
15 PRINT''CAME BACK'':END
20 GOTO 15
```

```
10 GOSUB 20 COMMENT COMMENT
15 PRINT''CAME BACK'':END
20 RETURN
```

Important for disk users. If you BREAK a running program in Basic always - but always type CLOSE immediately. You may have left a file open when you broke. Also, don't always bank on getting an error statement on attempted writes to a write protected disk. If you have changed a basic program and want to refile under the same program name on drive 1, then assuming that the earlier version was called TEST you would type SAVE''TEST:1. If there is no write protect tab on the Drive 1 disk you are O.K. and the new program overwrites the old. But, if a write protect tab has been put on the disk in the meantime, the system appears to write the new version and you come back to READY with no error message or hang up but **the new version has not been written.** This is on a formatted only disk by the way, I haven't tried a system disk. But if you habitually overwrite when writing a program (which saves cluttering up the directory) be careful! Garth Excell, one of our authors, had a problem recently with his Line Printer II so Tandy sent him a new one (OK he had to twist some arms but how many other companies would do that?) and it turned out to be a new model. It apparently has a new board in it and on the board is a DIP switch to enable the user to choose from, I think four European countries so that their monetary sign and accents are used. How about that - use the Tandy lower case mod and you can now both print and display the pound sign. Another important factor is that it is switchable at software for various character widths.CHR$(27);CHR$(20) is the 132 character call with CHR$(27);CHR$(19) to revert.

DISK DIRECTORY — ORGANISE YOUR DISK LIBRARY

We never publish programs which we do not think are interesting and well written. Accordingly, we always have something good to say about any program, even if we are, personally, not particularly keen on it. The result of this is that when we come across a really first-class piece of software, it is hard to think up the adjectives and laudatory praise which the program warrants. Such a program is Disk Directory of K:B: Smith. It is by far the best disk directory program that we have seen and there have been quite a few around. The majority of competitive programs take one of two approaches. Either the name of each program and its disk number have to be entered laboriously into a file to make up the directory, or, the program inputs this data automatically, but only runs under NEWDOS using its CMD''DIR'' command. This program will run under either NEWDOS or TRSDOS and is totally automatic. All that is necessary to enter details of the files contained on a disk is for that disk to be put in the drive. All data is taken off it completely automatically. The purpose of a disk directory, of course, is to create a file to which access may be made whenever you wish to know where a particular program is in your disk library. Each disk is numbered and on calling up the file, you are told upon which disk the program you seek is situated. The capacity of the Directory is 50 disks and 500 programs for a 32K machine and 150 disks and 1500 programs for a 48K machine. When you are building your directory, the procedure is to type in the number which you have allocated to a disk, together with the disk's name. The name can be any combination of characters up to a maximum of eight, providing that the first is not numeric and the last is not an asterisk. The reason for the latter stipulation is that you are given the option to add invisible programs to your directory and the method of doing this is to add an asterisk after the name. It is, of course, best to number your disks serially and in order to assist you with this the program will display the number of disks in file at any given time on the menu page. Amendments are very straightforward as if you use an already allocated disk number, then the target disk's directory will overwrite the existing data in the directory file for that disk number. Once the number and name have been entered, it is only necessary to ensure that the correct disk is in the correct drive and press the Enter key. The directory will then be displayed on the screen in a similar fashion to the DOS directory and a moving cursor will read off the data. Once the directory has been read, the program will also obtain data from the target disk as to the number of free files available and also the number of free granules. This data is also stored in the directory. The directory may, of course, be searched in order to find a program. An Instring function is used for the search so that you will still be able to find programs if you are uncertain of the complete program name. The directory file may be either listed on the VDU or the line printer. The data given for each disk is very full and consists of the disk number and its title, the number of files that are free and the disk and the amount of space which remains free. Also, of course, the names of the programs contained on the disk. The latter incidentally, are restricted to such a size that the printout paper may be cut and affixed to either the disk or its sleeve. We would recommend affixing the paper to the sleeve rather than to the disk. The final feature of Disk Directory is a machine language alphabetical sort of the entire directory. This is a very fast sort and takes about two seconds for 150 programs. The list may be displayed or printed out and will show all of the programs in alphabetical order. Invisible programs, if any, will be so indicated and each program will be followed by its disk number, name, the number of files free and the amount of free space on the disk in question. Provisions are, of course, made for scrolling the list on the screen. All in all this is a complete program with which to manage your entire disk library. It is suitable for a machine with a minimum of 32K memory and one disk drive. In fact, two separate versions of the program are supplied, one for single and one for dual drives. This program is suitable only for TRSDOS and NEWDOS. A Disk Directory for LDOS will be found elsewhere in the catalogue.

SEPTEMBER LISTING

SORRY!

We have had a large number of comments from customers asking why there was no listing in July/August. We do apologise for this, but we had two microcomputer shows ''Back to back'' and it was just not possible to find any time in between them to prepare the list. This edition contains a large number of excellent programs which we hope will make up for the delay in its issuance.

PROZAP — THE 3rd GENERATION ZAP

This program, written by Nigel Dibben, is well up to his normal excellent standard and, with the possible exception of Diskaid shown elsewhere in this list, it is the best one that we have seen. A zap is a program which enables disk users to get into their disk and carry out various investigations and modifications to the actual disk itself. In other words, the user is operating on the medium rather than in memory. PROZAP is a machine language program which loads automatically from the DOS state by simply entering in the program name. It has a large library of commands listed below, but probably its uniqueness centres upon its ability to access disks from which users have hitherto been locked out and its ability to copy a whole track into memory for investigation. Quite a fair number of disk programs come out nowadays, particularly from the United States, with various protection devices built in. The common gimmick, for instance, is to use non standard sector numbering. Such a device is not a bar to accessing the disk if you are using PROZAP. Display of disk contents is in hexadecimal and ASCII and a particularly appealing feature of PROZAP is a linked cursor so that if one positions the cursor over a hex number, the other cursor is automatically over the ASCII equivalent. The program is, of course, supplied on disk and may be used with single drive 32K minimum machines. There are two levels of command, the Command Level and Display Level. The library of functions available is as follows:-

Command Level

1. Display any sector
2. Automactically load the Directory track
3. Enter a DOS command, execute and return.
4. Recall the Buffer.
5. Display the disk statistics of a file.
6. Go direct and display a file by sector.
7. Copy a disk.
8. Go to Debug and return to PROZAP.
9. Disable the disk system usage.
10. Encipher a Password.
11. Read any track into memory so that the contents of it may be examined, including the sector layout and other data.

Display Level

1. Hexadecimal or ASCII modify mode.
2. Page to previous or next sector.
3. Jump to a specified byte
4. Display same track and sector, different drive.
5. Output a sector.
6. Zero all or part of a sector.
7. As above but with any non zero byte.
8. Search for a byte or search for a word.
9. Display Hash Code and its correct position.
10. Go direct into a file display mode.
11. Print a sector on the line printer.
12. Page to a new track or sector.
13. Save a sector to memory.
14. Load buffer from memory.
15. Match the current sector with another.

Note to 1982 Catalogue Re-write

A number of improvements have been made to Prozap over the year and a half that it has been in existence. Rather than add them to the above original catalogue insertion we are listing them separately.

Addition No. 1

1) Prozap is now compatible with LDOS and, for that matter, VTOS.
2) The error Reporting procedures have been changed. Immediately an error is encountered, a code number is reported on the display screen to give an unmistakeable error notice. When the user reverts to the Command mode, a full message is displayed of the current error.
3) Track identity of check mode is now available. Some disks are protected from inspection by irregular track numbering. This track ID mode overcomes this difficulty.
4) Track/Sector usage may now be displayed.
5) Limits on sector numbering may be selected.
6) IBM or non IBM formats may be selected.
7) Paging by track in addition to sector is now available.

As stated above, a number of additional improvements have been made. Probably the best is that at the Display Level a sort of synopsis of current statistics is displayed at all times.

Addition No. 2.

Prozap version 2 has now been upgraded so that it is compatible with the Model III Tandy machine, together, also, with the Model I when used with a double density on either machine. This has necessitated a number of command changes, for instance, as Prozap automatically checks whether it is reading a single or double density disk, the command I has disappeared as track numbers are checked on every read. Far more program variables may now be set by the user. For instance, the configuration of the disk is stored in a six byte table containing data on the density, granules per track, sectors per granule, low sector number, high sector number and sectors per track. All of these can be changed. An interesting feature is that if the track ID is not found within 5 passes, the density will be switched once and if it is still not found then the previous density will be restored and an error displayed. Repeated tries may be made if necessary. Two new commands are added so that the automatic disk density can be overridden manually.

DISKAID — ANOTHER THIRD GENERATION ZAP

This disk investigation and modification program is similar to Prozap shown elsewhere in this list. The two utilities, both of excellent quality, do have some different features and hence it was considered worthwhile to offer both of them, rather than choose to publish just one. Probably the best way to describe Diskaid is to list the commands, which are as follows:

0 Display sectors.
1 — Print sectors.
2 — Display memory.
3 — Print memory.
4 — Display file.
5 — Print file.
6 — Search file.
7 — Locate file.
8 — Directory repair.
9 — Encode/decode password.
A — Copy sectors.
B — Backup.
C — Copy bytes.
D — Clear sectors.
E — Verify sectors.
F — Escape to program/DOS.

Although both programs can display memory, they do so in different ways. Prozap does it through the debug utility, whereas Diskaid does it direct from the program itself. The latter displays 256 bytes at a time from any section of ROM or RAM starting at any address, ending in OOH. The directory repair feature in Diskaid is probably a little easier to use than Prozap, although with both programs the end result will be the same. With Diskaid the function restores read protected status to any sector of the directory track that has lost it. It will also examine every live entry in the directory and report on certain errors and finally, if no errors are found in the GAT or HIT sectors, these are re-written back to the disk automatically. The backup facility in Diskaid is similar to the one in Prozap, but does have the advantage that it may be used on a single drive. The Verify command in Diskaid is almost the same as the Match command in Prozap. Diskaid will encode and decode a password, whereas Prozap will only encode. The above are the principal differences in common commands. It is fair to say that Prozap contains more commands and features than Diskaid. On the other hand, Diskaid costs a little less than Prozap.

NEWDOS80 — A "NEW" NEWDOS

It should be mentioned first of all that although NEWDOS80 contains all of the features of NEWDOS+, it is not an upgrade, but is an entirely new piece of software. Unfortunately, therefore, we are not permitted to upgrade existing NEWDOSs to NEWDOS80. There has always been considerable criticism of the documentation supplied by Apparat with NEWDOS+ - indeed this is why we went to the trouble of producing two additional manuals for the program - not probably because of a lack of information, but mainly because of the complexity of it. Apparat have obviously taken such criticism to heart because NEWDOS80 is supplied with very complete documentation in a looseleaf binder and although it might be said that it retains some of the complexity of the old documentation, it is certainly very much more readable and understandable by the average user. It is interesting to note that NEWDOS + was essentially a modified and extended version of Tandy's TRSDOS, with a number of very useful utilities added. In NEWDOS80, however, although still supporting most of the features documentated in the Tandy Disk Basic Reference Manual, all of the routines have been re-written and complete copyright protection is claimed by Apparat for this new operating system. In NEWDOS+ the various "options" (for instance the ability to ignore passwords) require the use of Superzap to actually change the disk contents. NEWDOS80 contains many more options, but they are specified with a system command, which makes the alterations automatically. A number of these options disable various NEWDOS80 functions, but there are a number of others, for instance a "run only" mode, the choice of the number of retries on a disk error and the allowance of disk backups without the master password. Probably the most important factor of NEWDOS80 is that contrary to previous TRS-80 disk operating systems, each drive is considered by the system to be an individual unit. Hence it is possible to mix different capacity drives on the same cable. Default drives may be changed, searches for space may be stipulated to begin on drives other than zero, two control keys, namely Clear and Break, can be disabled. The latter is particularly useful when inexperienced users are anticipated. NEWDOS80 may be informed that you have a lower case modification and the HIMEM command is now available which will restrict NEWDOS and Basic to less than your full machine size. The Directory command has an option to print the directory and always displays on the title line the amount of free space on the diskette. The DUMP command will dump any range of addresses to a disk file and now has the option to write a memory dump file which can be disabled by the new Superzap. The latter, incidentally, is now a machine language program and although it follows the original Basic program very closely in use, it may now be called from the DOS. The COPY command has a new option that copies an entire disk to another disk, but file by file rather than track by track. This is particularly useful in re-organising a previously fragmented data disk. A NEWDOS utility called PURGE enables the killing of a large quantity of files with extreme ease. When the command is entered, the system goes through all of the files asking whether or not the files are to be deleted. This is particularly useful when building a mini system. In the same area is Mini-Dos, which is called by the simultaneous depression of the keys D,F and G. When these keys are pressed, the running program will be interrupted, its registers saved and the Mini-Dos state entered. In the Mini-Dos state, any of the library commands may be executed (with six exceptions) and a return made to the main program. Essentially, therefore, Mini-Dos is used when during the execution of the main program, the operator would like to interrupt it, execute one or more library commands and then resume the main program without any change having occurred to it during the interruption. A PDRIVE command defines to NEWDOS80 the size and type of your disk drives. 5¼" or 8" single-sided disks may be mixed. The only restriction being that the maximum track number is 96. Since the present capacity of 48 files per disk is a restriction on large capacity disks, an incompatible directory supporting as many as 222 files is now an option. Incidentally, with NEWDOS80, a data diskette may contain up to 62 files and still be capable of being read by TRSDOS. The DEBUG command is now entirely different. Unless previously disabled, it is called by pressing the keys 1, 2 and 3 at the same time. This is so, regardless of whether the DEBUG ON command has been issued. The Debug screen has been changed to display three separate memory areas which may be independently scrolled. It can also read and write disk sectors (if passwords have been disabled) and can search memory for a string of up to four hexadecimal bytes. Of great importance is that when modifying memory, the screen shifts to a display similar to Superzaps, where hex digits are typed over those disabled and the transparent cursor is moved by arrow keys. Chaining is now supported with the CHAIN command. The governing file is built in Basic. The Editor/Assembler, Level I facility, LMOFFSETT, the Disassembler and the Directory Check utilities of NEWDOS+ remain in NEWDOS80, essentially unchanged. Apparat, in their infinite wisdom, have "thrown in" a Spooler. The application of such a program is described elsewhere in this list. Essentially,it enables the printer to be printing whilst the CPU is doing other things. The documentation says that the Spooler was included at the last minute as a free program to NEWDOS80 owners. It is apparently not a fully supported part of NEWDOS80, whatever this statement may mean. We have done one or two tests on this Spooler and it seems to work quite well, but there are one or two provisions made by Apparat in the documentation as to when it should not be used. This approach seems to be rather unusual as one does not quite know where one is. We would suggest that even though, as we have said, it seems to work well, this feature should probably be ignored when a prospective purchaser is deciding whether or not to buy NEWDOS80. The Disk Basic provided includes, so far as we have been able to ascertain, all of the contents of the Tandy Disk Basic plus a number of additional features. Probably the most important part thereof is the file handling capabilities. No less than five new "file types" have been added and support is continued for the normal sequential and random access files. Without a doubt, the new file handling is extremely efficient, but it is also complex. It is certainly beyond the capability of these notes to describe. The most important point is that variable length records may now be used. Thus, the use of random access files is, in fact, made easier, but a considerable amount of documentation will have to be mastered beforehand. To make life a little easier, however, a NEWDOS80 user has written an appendix to the documentation, which explains the file procedures rather well. A sample program is also included. Incidentally, a sample program is also included to demonstrate the building of a chain file build program. A number of non input/output new Basic features are included which includes extended use of the CMD command. As previously mentioned, the new Disk Basic contains a RUN-ONLY mode. There are some incompatibilities between NEWDOS80 and TRSDOS. Indeed, there are some incompatibilities between NEWDOS80 and NEWDOS+. We have obviously only had restricted use of NEWDOS80 to date, but it seems to us that these incompatibilities are not very serious. In summary, the NEWDOS80 is a far more powerful disk operating system and the same remarks apply to the new Disk Basic. We have been asked a number of times the question whether or not NEWDOS+ owners will get their moneysworth out of NEWDOS80. Such a question is, of course impossible to answer, but as a very general comment we would reply with the question whether or not the prospective user wishes to mix different capacity drives on the same cable and whether or not he needs comprehensive file handling capabilities. If the answer to either of these questions is in the affirmative, then the purchase is probably worthwhile.

REMINDER ON DISK PRICES

Just a reminder that the offer contained on page 10 of the catalogue is a permanent one. Despite the very reasonable price of £24.00 for ten disks, we also give away five sleeves, which will hold ten disks, with every ten pack of disks. The disk sleeves are described on page 16 of the catalogue.

TOUCH TYPING COURSE — A SUPERIOR TYPING COURSE

There are a number of touch typing programs on the market, the purpose of which, to a lesser or greater extent, is to teach a person how to touch type on a typewriter by using the computer keyboard. So far as we know, up until now, they have all consisted of single tapes and although some of them are very good, particularly Microsoft's Typing Tutor, none of them really profess to be a complete course on the subject. To some extent they may be described as practising sessions guided by a program. This course, however, is complete and consists of no less than eight separate and different lessons. These, incidentally, may be purchased either as a complete suite, or separately as the student progresses. The suite offers a methodical learning process which gives the necessary instruction in a progressive and efficient manner. Learning is automatic, not requiring any self-discipline on the part of the user once the initial decision has been made to load the program. All user errors are monitored and the program reacts to such mistakes. It is suitable for any age of student. It would, for instance, be possible for a seven year old to learn to type from it whilst, on the other hand, a school leaver should be able to pass a typing exam and get a job on the basis of the first six programs. Probably the most important point is that a rhythm, which is so important to typing, is maintained throughout the lessons. It is only by attaining this rhythm that a user is able to increase speed past about 25 words per minute. The system of teaching used in the lessons is a variation of the well tried and tested horizontal method, adapted to make use of the unique characters of computer assisted learning techniques. Typing speeds are varied during the first four lessons in accordance with the difficulty of the material presented and the user is told his final speed when he reaches the end of the lesson. The fastest of the optional speeds in lesson 5 brings the user to about 30 words per minute and in lesson 6, this is 35 words per minute. In the last two lessons, the student chooses his own speed, which is analysed line by line in the program. The last two lessons, nos. 7 and 8, are practice sessions, In lesson 7, the practice is in copy typing from amended copy and in no. 8, in high speed typing. Hence, these two lessons are to some extent optional. The contents of the lessons are as follows:

1. Second row (home keys). Each practice text maintains rhythm while building up accuracy at a set speed.
2. Third row. Exercises as above, using sentences from the second and third rows.
3. First row. Exercises as above, with sentences from the first three rows, and introducing the use of the SHIFT key for symbols and initial capital letters.
4. Top row. Exercises as above for the top row numbers, followed by exercises for the symbols with optional practice length. The BREAK key is disabled to avoid accidental BREAKing and there is more practice with the shift key and with various kinds of text material.
5. The basis of the error-count is now word-by-word, as used in speed tests, and the user is provided with a series of types of texts chosen from menus. There is a simulated Shift Lock and also an automatic spacing mechanism. For each text, one of three possible speeds can be chosen. Rhythm is still maintained, the user now being given a period of time to type each word which is proportional to its length, thus reducing the strictness of the previous letter-by-letter rhythm drill. At any time the user can obtain an evaluation of his error rate at the chosen speed.
6. As in no. 5, a menu is provided, and the three possible speeds are now faster, the fastest being 35 w.p.m. Use of the ENTER key when typing computer program lines is introduced and practice in the use of a Tabulation device is now available, allowing the user to copy tabulated material provided in the documentation.
7. This lesson offers practice in copy typing from three texts provided in the documentation: poor handwriting, neat handwriting with amendments, and typescript with written amendments. The amendments are made using standard symbols for correction of printers' proofs, and a separate list of these symbols is provided. The correct version of the texts is contained in the program and the user can call up the correct version of a line to compare it with the version he has typed. He can now type as fast as he likes and the time taken on each line as well as his words per minute rate overall will be given.
8. The user can build up his speed by typing a long text as fast as he likes; it is stored within the program and can be called up line by line for comparison with the original. The words per minute rate on each individual line is given.

Each lesson uses between 10 and 15K of memory and so the entire course may be used by 16K owners. Available on disk as a complete course.

DARK VOID — RAYS, ATOMS AND MOLECULES

This is a board type of game, the purpose of which is to locate in the dark void a number of atoms by shooting rays into it. The board is made up of 64 squares into which atoms are placed by the computer. These, of course, cannot be seen by the player, although a number of them can be chosen by him up to a maximum of seven. Depending on certain set rules, the ray which is shot into the Dark Void will behave in one of three ways. It will either be absorbed, which indicates a direct hit on the atom, or it may be reflected back out of the Void in the same position as which it entered. Finally, the ray may be deflected by the atom, in which case it will emerge from the Void, but not in the same place at which it entered. By means of the data gathered from the behaviour of the rays, the position of the atom can be deduced. Rays incidentally, may be deflected by more than one atom at a time which makes life rather difficult. Although the board is graphically represented, and other display graphics are used, throughout the game, Dark Void is, essentially, a game of logic and deduction and as such it is a very good one. Apart from the clues given as to the behaviour of the rays, the only other aid that the player really has is the ability to mark (and erase) various squares on the board. This is purely visual aid to help the player keep track of what he is doing. It does not affect the game as such. This game also features sound and a choice of skill level. A time factor is also included, the length of which is set by the skill level.

FARMER BROWN — STRICTLY FOR THE CHILDREN

This program does not in any way pretend to be a program for adults, although the graphics are so good that many adult programmers will wish to investigate the writing of the program. It has evolved from a very old children's game, whereby Farmer Brown has a farmyard through which many peculiar animals and objects pass. Pictures of these animals walking across the screen are displayed and the child must enter the first letter of the name of the animal in order to gain a point. Points are deducted for incorrect or zero responses and the maximum score is 300 in 30 tries. There are 26 animals or ''things''. The graphics are excellent and will probably appeal to an age group from about five to ten years, although the author tells us that he wrote it for his two sons, one of which is only aged three! Sound is included in the program.

TABLES — LEARN MULTIPLICATION WITH FUN

This is a unique program, the purpose of which is to get youngsters, of say around eight years of age, to learn their multiplication tables (a) without knowing they are doing it and (b) having fun at the same time. Actually it is rather hard to describe the program because it really boils down to the child having a chat with the computer. When first starting, the program asks the child whether he or she wants to do some multiplication, or have a chat. No doubt the normal child response would be to have a chat and this leads into a whole forest of cross jokes and comments, most of which inevitably lead back to the child doing some multiplication. The program has been extensively tested with a number of children and apparently the writing of it became evolutionary. However that may be, the result is a program which is sure to interest the children and educate them at the same time.

HANNIBAL — NOT FOR THE FAINTHEARTED

Before we attempt to describe this program, we should mention that it is a serious war games program from Dr. Bodley-Scott, who was a co-author of Emperor. It is a long game and a complicated one. For this reason, incidentally, provision is made for saving on cassette a partly played game. Basically, Hannibal is an authentic, historical simulation of the Second Punic War, the epic struggle between Rome and Carthage for supremacy of the Ancient World. It is a game of considerable strategic skill for two players. The game starts in 220 BC and each year has three campaigning moves, Spring, Summer and Autumn. Taxes are collected and troops paid during the Winter

break. In each move, both players take their turn, whereafter the result of any conflicts are determined. As it is an advantage to have the second turn of the move - since you will have had the opportunity to see your opponent's moves before deciding on your own - each player has the first and second move alternately. There are four maps, which although they are to different scales, are continuous with one another. The maps are of Italy, Spain, Africa and Sicily. It is not intended in this brief summary to go through all of the various troop movements, treasury reports, recruitment and wars which are included in this game. Suffice it to say, the game is very complete. It may, however, be of interest to prospective purchasers for us to give some of the historical background to the time in question. In 264 BC Carthage, a Phoenician colony with a North African and Sicilian empire of respectable antiquity, first came into conflict with the younger and rapidly expanding state of Rome. In the First Punic War, which lasted until 241 BC, the Carthaginians lost both their Sicilian possessions and naval supremacy in the Mediterranean. Sicily became a province of Rome, only the powerful Greek city-state of Syracuse remaining independent. By way of compensation, the Carthaginians began a systematic expansion of their possessions in Spain. The great new city of Carthago Nova was founded there in 227 BC. In 219 BC Carthage's young general, Hannibal, laid seige to the city of Saguntum. This city had a treaty of protection with Rome, and so Rome declared war on Carthage. After capturing Saguntum, Hannibal made a surprise march across the Pyrenees and Alps into Italy. Here he defeated every army the Romans brought against him for sixteen years, but never managed to capture Rome itself. Meanwhile, a Roman army sent to Spain succeeded in defeating the Carthaginian forces there and conquering the entire province. In 204 BC a Roman army crossed to North Africa and defeated the Carthaginians at Tunis. Hannibal was recalled from Italy, but was defeated by the Roman general Scipio at the battle of Zama. Carthage was forced to accept humuliating peace terms, and Hannibal fled into exile when the Romans demanded his extradition. He commited suicide in 183 BC. In 149 BC the Romans engineered a further war with Carthage, in which Carthage was destroyed and its citizens sold into slavery. As will be seen from this background, there is plenty of scope for a very enjoyable game. It is supplied on cassette and will run in a 16K machine, but floppy tape users will require 32K.

INCOMPLETE RECORDS — PROVIDES TRIAL BALANCES AND TRADING ACCOUNTS

Two important points before we describe the program. Firstly, it is written by an accountant with programming experience, rather than the other way round and although it is written particularly with the accountant in mind, it may be used by any company for their own accounts. The second point is that although it is entitled an Incomplete Records program and, of course, performs that function, it is equally suitable for the production of accounts where the complete books of account are kept, when it then performs the function of a Nominal Ledger and produces Trial Balances and Trading Accounts. It is particularly aimed at, and will have the most application to, small to moderately sized businesses, such as shops, farmers, smaller production companies and so on. The purpose of the program is to computerize the production of the annual trading account, profit and loss account and balance sheet. As the data is always held in memory, the maximum number of entries is set at 1200, each one consisting of a code, amount and description. Such a capacity should be suitable for the type of companies mentioned. The number of analysed codes is 80, which may, of course, be allocated as required. The system is self-balancing in that it is not possible to exit from a batch of input without balancing it to zero. Totals under each analysed code are accumulated as the date is input and hence a balanced trial balance can be extricated at any point during the run. In its present form, the program is suitable for sole traders only, as only one Capital Account is included. The program can be used for partnerships, in which case Capital Acccount figures between the partners must be manually analysed. Specimens of the Trading and Profit and Loss Accounts and the Balance Sheet are shown below. The program is, of course, disk-based and requires a full system, that is to say 48K of memory, two disk drives and a line printer. A manual is supplied.

```
BALANCE SHEET AT 31 MARCH 1980
FIXED ASSETS              COST     DEPRECIATION      NET
FREEHOLD PREMISES       45,000.00   -15,000.00    30,000.00
FIXTURES & EQUIPMENT     3,215.00    -1,155.00     2,060.00
MOTOR VEHICLES           7,675.00    -1,545.00     6,130.00
                        ----------  ----------   ----------
                        55,890.00   -17,700.00    38,190.00
                        ----------  ----------
CURRENT ASSETS
STOCK                                  1,567.50
DEBTORS                                4,528.33
BANK                                   7,357.17
                                      ----------
                                      13,453.00
                                      ----------
CURRENT LIABILITIES
HIRE PURCHASE                         -2,341.22
CREDITORS                             -5,026.73
                                      ----------
                                      -7,367.95
                                      ----------
NET CURRENT ASSETS                                   6,085.05
                                                   ----------
                                                    44,275.05
                                                   ==========
                    REPRESENTING:
CAPITAL ACCOUNT
OPENING BALANCE                                    -38,940.00
NET PROFIT                                         -15,335.05
                                                   ----------
                                                   -54,275.05
DRAWINGS                                            10,000.00
                                                   ----------
                                                   -44,275.05
                                                   ==========

TRADING AND PROFIT AND LOSS ACCOUNT
YEAR ENDED 31 MARCH 1980
SALES                                                -106,412.89
PURCHASES                                             54,896.36
                                                     ----------
TRADING PROFIT                                       -53,516.53
                                          49  %
LABOUR COST                            35,615.77
RENT                                      500.67
RATES                                     143.22
POWER                                     231.23
REPAIRS & MAINTENANCE                     110.00
TELEPHONE & POSTAGE                       180.76
MOTOR & TRAVEL                             60.00
EQUIPMENT RENTAL                           96.00
BANK CHARGES                              432.11
HIRE PURCHASE INTEREST                    341.22
ACCOUNTANCY FEES                          370.50
SUNDRY EXPENSES                           100.00
                                         ----------
                                                     38,181.48
                                                     ----------
NET PROFIT                                           -15,335.05
                                                     ==========
```

KNIGHTS TOUR — A CLASSIC CHESS PUZZLE

Knights Tour is a very well known chess puzzle whereby the player has to move a Knight, in its normal move configuration around a chess board so that it occupies throughout its tour all of the available squares and does not occupy one on more than one occasion. There have been a number of programs written for the TRS-80 that play this game, but none of them have really been of sufficient standard for us to stock. This one is English written and is of a very good standard. The graphics of the board are good and a trace command is available. The effect of this, of course, is to retrace the Knight's steps. All in all a nice, little program for the Winter evenings!

SUPERLIFE — THE ULTIMATE GAME OF LIFE?

The game of life is so well known that it hardly requires any description. We already stock what one might call the standard Life and also a graphics version. For the uninitiated Life is played by placing cells on a matrix or board in any required pattern. The game proceeds by ''generations'' and between one generation and the next, if a life cell has exactly two or three cells as neighbours, it survives to the next generation, otherwise it dies. If an empty square has life cells on three of its eight neighbouring squares, a new cell is born, otherwise nothing happens. The object, of course, is to find interesting patterns, patterns that repeat after a fixed number of generations, patterns that grow at a fast speed and so on. The usual limiting factor in the game of Life is the size of the Board. Some games get over this by

wrapping around, but this often leads to errors. The great advantage of Superlife is the size of the board available. Superlife 1 has a matrix of 256 x 256 squares and is suitable for a 16K machine. Superlife 2 has a board of no less that 65536 x 65536 squares and is for 32k machines. In other respects the two versions are identical. Obviously these vast boards cannot be shown on the screen all at once and for this reason a ''window'', 64 squares wide by 15 high is provided. This can, of course, be moved so that you can look at any part of the board.

MACHINE CODE TO BASIC — AN EASY WAY TO M/C SUBROUTINES IN BASIC

It often occurs that a machine code subroutine is more easily kept in data lines in the Basic program so that the host program can simply poke it into memory. Using this approach, it is not necessary to load a Basic program and a System tape. This program enables the user to place machine code into data statements automatically. The machine code can be placed in high memory in any way including loading a System tape. This program is then run. It reads the machine code and places it into data statements in the Basic program. The command LSET is then typed and deletes the main part of the program and then renumbers the data lines starting at 1. A further command is typed, MERGE, which blocks off the data lines and enables the user to either CLOAD or enter from the keyboard any Basic program. When this has been done, the command RSET is entered, which automatically combines the program and data together. The resulting program, therefore, contains the data representing the machine code. This is particularly straightforward and easy program to use and saves a great deal of time and energy over the more normal approach of converting machine code to decimal and entering it in as data lines. The program, at this time, is only suitable for 16K Level 2 machines.

SPOOLER — INCREASE YOUR THROUGHPUT FOR THE MODEL I

Later in this list will be found a general description of the operation of Spooler for the Model II computer. Customers are requested to kindly refer to that section before reading on so that it need not be repeated herein. The Model I Spooler comes in a similar form to the Model II in that a large number of versions are available on the same disk, so that the size of the buffer and the memory size location may be chosen. It also comes with versions for both 16, 32 and 48K machines. All that is necessary to be done is that the appropriate version is chosen and copied from the distribution disk to the system disk with the appropriate file name and the extension/CMD. This is then called up from DOS and the Spooler will be active and functional for all LPRINT commands. Most other functions are also supported, including the NEWDOS ''JKL'' operation. The Spooler is entirely transparent to the user once loaded and so is extremely easy to use. As the Model I is a slower machine than the Model II and generally the printer will be slower as well, it is with the Model I that the true advantage of Spooler will be most apparent.

STOCK 80 — A MAJOR NEW STOCK CONTROL PROGRAM

This is a new Stock Control program from Microgems. It is, in a number of respects, similar to the Tridata Stock Control and like that will form an integrated part of Sales Ledger, Purchase Ledger and other accounting programs yet to be written. Meanwhile, of course, it can be used on its own. One of the features of the program is its ease of use. A prime specification of its writing was that the user should require only a minimal understanding of how to use the TRS-80. The features of the program orientated to the various menus are as follows:

1. Maintain stock file by entering or changing details for each item in the stock file. Enter sales, enter stock orders and stock receipts.
2. New sales period. Reset any of the sales periods to zero.
3. Initialise stock file diskette. Self explanatory.
4. Maintain a general information file containing the company name and other ''formal'' statistics.
5. Auto price update. Amend blocks of prices sharing a known supply code or masked item code.
6. Stock file listing. List the stock file contents in item order for a particular supplier or grouped by supplier.
7. Low stock report. The same as the stock file, but limited to items below a minimum stock level.
8. Out of stock report. Again similar to the stock file, but limited to items currently out of stock.
9. On order report. As stock file, but limited to items currently on order.
10. Back order report. As stock file, but limited to items currently back ordered.
11. Stock movements report. As stock file, but reporting on stock movements for specific periods.
12. Grouped item breakdown. As stock file, but listing grouped items and their sub-items only.
13. Pricelist. As stock file, but presented as a pricelist.

There are a number of unique features to this program. Apart from the normal password protection, a ''grouped items'' facility is available, whereby the system allows groups of items to be referred to by a single item reference. Operations on grouped items such as stock sales then result in the automatic amendment of the appropriate data fields in all of the items contained in the group. Two important features are implemented by the use of the machine code searching routines. The result of the first is the stock file maintenance sub-system is a genuine ''on line'' system with all details of an item being retrieved by item reference within an average of two or three sections. Any amendments to item data are then immediately transferred to the stock file without the generation of transaction files often associated with stock control systems on microcomputers. The second item of important relevance to the machine language coding is a very fast sort routine whereby the routine orders the stock file by item reference before printing proceeds and items can be grouped by supplier or not as required. The power of the sorting sub-routine is such that 1,000 items can be ordered for listing in about fifteen seconds. A very full and explicit manual of over 50 pages is supplied with this suite. The program is compatible with either TRSDOS or NEWDOS and requires a two disk 32K minimum configuration.

QRA LOCATOR — A DISTANCE CALCULATOR

The QRA Locator system is used extensively by radio amateurs in England and the function of this program is to calculate the distances between any two points in Western Europe using the coding promulgated by the Radio Society of Great Britain. This coding is based upon a grid overlay of Western Europe. We are not able to publish the map that shows this grid because it is copyrighted by the Society. They tell us, however, that copies are obtainable from them for a few pence. As amateurs will know, the system is used most commonly on the VHF bands and this distance calculator is accurate within reasonable limits up to 600 nautical miles. The distance may be calculated in either statute or nautical miles or in kilometers. The program requires the input of the home station's QRA code and then code for each other station that has been contacted. The output is either to the VDU or to a line printer. An added feature to the program is a system for calculating points scored according to the usual system(s) used in Great Britain. The separating rings are set to 50 kilometers, but this can be changed by altering a line in the program.

DOSFIX — FOR FREE, BELIEVE IT OR NOT

Throughout the catalogue will be found a number of programs written by Snapp Inc. In addition to these utilities they have written two patch programs, one for the Model II and one for the Model III. In both cases these patches modify TRSDOS. Most of the changes, which, incidentally, are permanent, relate to errors in the DOS. Some, however, add new facilities. For instance, one on the Model II is to move the Break key from its present position, where it can easily be hit by inexperienced operators, to control 6. Probably most importantly, these patches are supplied free on disks which contain Snapp programs.

TRACKER — A TRACE PROGRAM FOR MACHINE LANGUAGE PROGRAMMERS

Tracker is a dynamic simulator trace which finds its most common application in the debugging of machine language programs. It carries out the following functions.

1. Load programs successively from disk and trace them.
2. Simulate the runs of a machine code program seeing, at each step, the effect on the registers.
3. Send trace output to the printer.
4. Trace the main structure of the program only by confining the output to jump type instructions.
5. Single step through programs.
6. Run programs untraced, subject to return at a breakpoint.
7. Examine and alter memory.

The program operates in three modes. Command mode, trace mode and display mode. The features available in Command mode are as follows:-

1. Load the program from disk.
2. Set the contents of registers.
3. Pop the stack.
4. Push the stack. Tracker, incidentally, maintains a separate internal stack for the object program.
5. Change to Display mode.
6. Set breakpoints. These may be anywhere in memory, even in ROM.
7. Set breakpoints and the program counter, then run program untraced until a breakpoint is encountered.
8. Enter trace mode and run.
9. Enter trace mode, single step and pause.

The following functions are available in both Command and Trade Modes. The first four operate as toggles, i.e. they turn the facility on or off, depending upon its present position.

1. Turn the printer on or off.
2. Pause automatically after every fifteen lines or run continuously.
3. Run the trace at fast speed. When this function is off, the trace runs at about two lines per second, otherwise as fast as the display can scroll.
4. Limit the display or printout the jump type instructions.
5. Display a line showing the state of the program counter registers, the instruction it points to and the contents of the other registers before the instruction is obeyed.
6. Display the contents of alternate registers.

The following commands are available in Trace mode:-

1. Pause.
2. Resume tracing.
3. Single step and pause.
4. Go to Command mode.

In the display mode, a display is shown of 256 bytes of memory starting at a chosen address. Hexadecimal and ASCII are displayed. Lower case is converted to upper case. Graphics and control characters are replaced by full stops. The commands available are as follows:-

1. Advance one page.
2. Retreat one page.
3. Move to a specified new page.
4. Return to Command mode.
5. Change memory starting at a specified byte.
6. Replace a current byte.
7. Move to next byte without change.
8. Move to next line.
9. End changes.

This program constitutes an extremely useful and advanced tool for the machine language programmer as can be seen from the commands above. It was written, as was Diskaid and Superlife shown elsewhere in this list, by Mr. K.P. Leary.

Note to 1982 Catalogue Re-write

Tracker was subject to a major upgrade in late 1981 and is now entitled ''Tracker V.2''. Six new commands are added, particularly the ability to load non-command programs and files without extensions in their file specifications. Current register contents can now be saved, including Stack Pointer and Program Counter. A new command will restore the registers to their state before the last register saved command. Additional convenience features include the back arrow to retreat to a previous byte without changing anything, and the up arrow to move back one line without changing anything. The break point command is improved chiefly with regard to ease of use.

80 TRACK

There has been some misunderstanding regarding the number of tracks per inch, particularly with 77/80 track disks. The standard is in effect set by Cumana Ltd. who import the Teac Drive which is fast becoming the standard for both Tandy and Genie machines. Originally these drives were 100 tracks per inch, but some of the American drives were 96. The two are not, of course, compatible. Cumana have now advised us that they are adopting the following standard, namely that drives for the Model I are 100 tracks per inch, drives for the Model III are 96 tracks per inch.

GOLF — A GOOD GRAPHIC SIMULATION OF THE GAME

This is a disk orientated program written in Basic with a machine language subroutine. It follows the real game quite closely. As supplied it has seventeen holes, but provision is made in a separate program for the user to construct different, or additional, holes as required. Each hole is played on a map of the course on which is shown various symbols indicating the features of the hole being played. Up to four players may take part at the same time. Strokes are made by indicating the club and angle of stroke required. Eleven clubs are provided, divided into two woods, six irons and three wedges. Each club will produce stipulated length of stroke. Course, terrain and weather information is continually available. The weather is of some importance. If, for instance, this is stated as humid, then the ball will not travel as far as when the course is dry. It is assumed that players have a reasonable skill because, generally speaking, the

ball will always play towards the hole. Its course will, however, be altered by the wind and by a small, random amount. Angles will, of course have to be used in order to avoid hazards, but when on the green and putting, angle entry will usually be zero. Angles of plus and minus 90° are permitted. The former will play the ball directly down the screen, whilst the latter will play the ball directly up the screen. The map of the course shows distances in increments of fifty yards. When choosing his club, the player should bear in mind that wedges should not be used against a moderate or strong wind, not in the rough or bunker. Irons can be played for most shots. Wedges are usually used in bunkers and will require the player to set a power value. Bunker shots are subject to a 25% loss of distance. If the ball is struck so that it lands off the course, it will be moved automatically to the middle of the course in a playable position and if it lands in a haphazard position, it will also be moved towards the tee to a playable position. Both of these events carry a one stroke penalty. Some holes are so long that two displays of the map are required. This does not, of course, affect play in any way.Each hole is selected randomly by the computer, but only one hole in the collection can be played once in a game. An enjoyable and skilful game, which balances rather nicely the inevitable restrictions of a computer game and the enjoyment of an actual round of golf.

NUCLEAR WAR — NOT THE REAL THING!

This is a conversational program of strategy, based upon the possibility of nuclear war. It is not a graphics program. It may be played by one to twelve players. The computer takes the place of as many players as is required. Each player has the control of one major country and has to successfully destroy all enemy populations in order to win the game. The country has control of offensive and defensive missiles, together with factories within which to manufacture them. There is also a set of minor countries, which like the majors, number twelve. A minimum of three must be engaged in the game. Major countries are called upon to donate money to minor countries and if they gain control of the minor, they will have the benefit of the missiles produced in that country. On each turn, players have various options, including building missiles and anti-missiles together with new factories. Additionally, cash can be raised by selling factories to minor countries. Once the preliminaries are dealt with, new ratings for computer controlled major countries are calculated, so that missile targets and defences may be decided. Thereafter, each player, including the computer, is asked whether or not they wish to declare war. If they do not, they cannot, of course, fire any offensive missiles. Population growth and cash revenue are larger in peacetime. Declaring war early allows a surprise attack, but for reasons of humanity (!) computer controlled majors are biased against the first warmongers! Missiles are fired by typing the target country and quantity. The major must also specify whether he wishes to aim at population or factory targets. After anti-missiles are allocated and when all attacks have been decided upon, the effects are calculated. Each missile that gets through will destroy one million of the population or one-third of a factory, depending on the target. When a major country loses all of its population, it is eliminated from the game. If all countries, except one, are eliminated, then that one is the winner.It is (as indeed it would be in a real war) possible for all countries to be eliminated in the same turn, which rather emphasizes the fact that in a real nuclear war, everyone will lose. At the end of each turn, a minor might become neutral, in which case money donated to that minor is lost. Minor countries may never be attacked. In summary, this is a fairly simple game of strategy, the subject matter of which is rather depressing but, we suppose, nonetheless interesting for that. It needs full 16K, but we have asked the author to try and reduce the size for floppy tape users.

MODEL II

We should explain our policy with regard to the Model II software which has evolved over the last few months. Both Tandy and Tridata informed us that they were introducing business orientated software. As a result, we are, and will be, centring our main thrust on utilities and programming aids. There will be one or two business programs from time to time, but in the main we are trying to provide Model II users with extremely high quality programs which help them to run their machines and write their own programs. The following selection constitutes prime examples.

SPOOLER — INCREASE YOUR THROUGHPUT

Normally when a program has print routines in it, the CPU has to hang around waiting whilst the printer does its thing. The result of this is that programs which have a fairly heavy print content can take a considerable time to run simply because the printer is a slow peripheral. Obviously some printers are slower than others, but with almost all (with the possible exception of the Line Printer 3, which seems to have a type of spooler built in) considerable delay is inserted into the run time. The Spooler utility enables the machine to go about its business whilst the printer is delivering output. In this way, maximum utilisation is made of both the machine and the printer and some programs will run up to twice as fast as they would if they did not have the Spooler installed. Essentially, therefore, the effect is that the processor does not have to wait for the printer to finish printing before it processes its next step and likewise, the printer does not have to wait whilst the processor thinks about what is to be printed next. The Spooler comes in the form of a program which is loaded either automatically or manually from DOS.Once loaded it is transparent to the user, in other words, he can forget that it is there. The advantages will be automatic.This Model II Spooler comes on the same disk in a large number of versions from which the user can choose one most applicable to his needs. The reason for the different versions is so that the operator may, if he wishes, load other machine language programs, which will run concurrently with the Spooler. Furthermore, the Spooler is provided in several versions which give varying sizes of buffer, that is to say, take up different amounts of space in the computer. The larger the buffer that can be used, the greater the advantage will be. In addition in this particular Spooler program there is a program called TOPSPOOL, which does not occupy any user memory space at all. As touched on above, the advantage derived from the use of the Spooler can be very great, but we should point out that it is impossible to give any concrete figure representing the advantage to be gained, because it will depend on a number of different parameters, chiefly how much printing is being done and the speed of the printer being used. Using Tandy Line Printer 2 with a mailing list, for instance, we found that without the Spooler a given number of names would take six minutes to printout, but with the Spooler installed, control was returned to the keyboard in just under four minutes. There was, therefore, a gain of just over one-third. On the other hand, with the Line Printer 3, which is a dual direction printer and therefore has a much higher throughput anyway, the advantage was only about thirty seconds. The Spooler is available for either parallel or serial printers. Further versions are available both in parallel and serial form as disk Spoolers. These store their buffer on disk rather than in memory.

MASTER/SLAVE — A FULL COMMUNICATIONS PACKAGE FOR THE MODEL II

This software package was designed to support the transference of files from one Model II to another via direct connection or modem. All types of files, whether executable program files, Basic programs (ASCII or compressed) and data files may be transferred. Any record length is supported. The only restriction known at this time is that data files may not have more than 32767 logical records, but as this is the same restriction imposed by Basic, it will hardly be a problem. An important feature of the product is that one of the stations - the SLAVE - may be unattended. This feature will be particularly valuable in many circumstances, especially when long distance communication is involved, perhaps spanning several time zones. Both stations must have SETCOM set and the modem at full duplex. One modem is set to originate and the other to answer. Similarly, one station must run SLAVE whilst the other runs MASTER. So far as the SLAVE station is concerned, this is the end of the operation. As can be seen, if the SLAVE station is to be unattended, all the operator has to do is to run SLAVE and leave. After the MASTER station has run MASTER, he will be asked for a command. There are four available - GET, PUT, TERM and END. The GET command will transfer a specified file from the SLAVE unit to the MASTER. The PUT command works in exactly the same way, but in reverse, that is to say it transfers the file from the MASTER to the SLAVE. The TERM command presupposes that the HOST/TERM package is available, whereupon the SLAVE will become the HOST and the MASTER will become the TERM. the END command is the same as Break and returns the MASTER to TRSDOS. the SLAVE is left in SLAVE mode.

EXTENDED BASIC — A REAL BOON TO THE BUSY PROGRAMMER

The only real disappointment that we experienced when we started to use the Model II was the absence of the various little aids to which we had grown accustomed using NEWDOS+ on the Model I. This Extended Basic program enables most of these aids to be used on the Model II. Before we describe the features, we should emphasize that this is a patch program, that is to say, the present Basic on the operating disk is itself altered, hence, once the patches have been made, they need not be made again on that disk and (as with NEWDOS+) it is exactly as if the features are permanently installed in the interpreter, as in fact they are. A further advantage of not having to load the program each time that it is to be used is that no user memory nor user disk space is taken up. Extended Basic is divided into 5 sections as follows:-

XBASIC
This module enables the use of six single key stroke commands and ten abbreviations as follows:-

Left arrow	—	Will list first line of a program.
Right arrow	—	Will list last line of a program.
Up arrow	—	List previous line of a program.
Down arrow	—	List the next line of a program.
Fullstop	—	List the current line.
Comma	—	Edit the current line.

The ten abbreviations are:-

A	—	Auto	L	—	List
C	—	CLS	M	—	Merge
D	—	Delete	N	—	New
E	—	Edit	P	—	Line printer list
K	—	Kill	S	—	System

It will be seen from the above that a number of convenience features are similar to those in NEWDOS, particularly the use of the comma and the four arrows. The advantages from using these single key stroke inputs are obvious. The S to take one back to DOS is particularly useful and it can be followed, of course, by a DOS command in quotes. Thus, S''DIR'' will automatically list the directory drive 0. XREF

This is similar to the cross reference utility already introduced for the Model II. The purpose, of course, is to produce a list, either on the VDU or the printer, of any, or all, variables or line numbers used within the resident Basic program, with information about each location within the program whether the variable or line number is used. XREF is called merely by typing the letter X whilst in Basic, followed by various parameters as follows:-

X.	—	List all references to the screen.
X,	—	List all references to the printer.
X.vv	—	List all references starting with vv to the screen. vv can be any variable.
X.nnnnn	—	List all references starting with nnnnn to the screen.
X,vv	—	List all references starting with vv to the printer.
X,nnnnn	—	List all references starting with nnnnn to the printer.
Xvv	—	List only references to the variable vv to the screen.
Xnnnnn	—	List only references to the nnnnn to the screen.
X	—	List the next program line containing a reference to the last Xvv or Xnnnnn command.

In the above formations, the vv represents any variable name and may consist of either one or two characters. The symbol nnnnn represents any (line) number and may consist of from one to five characters. The format of the listings is normally for cross reference programs, that is to say, the variable requested will be shown on the left side of the screen followed by one or more reference entries. XREF does not attempt to distinguish between line numbers and integer constants so both will be listed together.

XDUMP
It is hard to select one of these modules which is the most useful, but certainly this one must be close to the top. The purpose of the routine is to allow the programmer to list to the VDU or the printer all variables used in the program **together with their current values.** The command is invoked by typing the letter Z in a similar way to XREF with the letter X, as follows:-

Z	—	List all variables to the VDU.
Z.	—	List all variables to the printer.
Zvv	—	List only the named variable to the VDU.
Z.vv	—	List beginning with the named variable to the VDU.
Z,vv	—	List beginning with the named variable to the printer.

Array variables will have each number listed separately. The program supports arrays of up to ten dimensions. Each variable is listed on a new line followed by its type character (% for integer, ! for single floating point, etc.) followed by its current value.

XRENUM
This is an enhanced renumbering utility to the one supplied with the Model II. Its big advantage is that it will not only renumber Basic program lines, but it will also move them. In a similar way to NEWDOS+ it will also search the text for undefined sequence numbers and for some errors associated with Basic statements. Whenever any of the commands in XRENUM are used, the user is informed of the total number of program lines, together with the total number of bytes in the old program text and if changed, the total number in the new text. The operator is also informed of whether or not the text has been changed. The commands are as follows:-

R	—	Searches all the text for undefined sequence numbers and some errors.
R sssss,iiiii,ppppp,qqqqq	—	This will cause all text lines whose sequence numbers are less than or equal to ppppp and less than or equal to qqqqq to be assigned new line numbers. sssss is the first new line number and subsequent numbers will be generated by adding iiiii to the line number of the previous text line.

When all four parameters are used, a move will be made. Assume, for instance, that a program is numbered consecutively in increments of 10 from 10 to 1000 and the line R 2000, 100, 860, 870 is entered, then the new program will no longer have lines numbered 860 and 870, but these lines will have been added at the end of the program as lines 2000 and 2100.

XFIND
This utility is used to produce a list of any or all strings or Basic Keywords used within the resident programs as follows:-

F.	—	List all keyword references to screen.
F,	—	List all keyword references to printer.
F.''kw	—	List all keyword references starting with 'kw' to screen.
F,''kw	—	List all keyword references starting with 'kw' to printer.
F.''ss''	—	List all string references starting with 'ss' to screen.
F,''ss''	—	List all string references starting with'ss' to printer.
F''ss''	—	List all string references which CONTAIN 'ss' to screen.
F''kw	—	List all references to 'kw' to screen.
F''kw1&kw2	—	List all references in which kw1 and kw2 appear in the same program line to screen.
F''kw1,kw2	—	List all references to kw1 to screen and REPLACE each occurrence of kw1 with kw2''.
F	—	List 'next' program line containing a reference to the last 'F''ss''' or 'F''kw' command.

XCOMPRESS
This reduces the size of the resident Basic program to a bare minimum. Although definite figures are not possible as they will vary with different programs, typically a program that has been compressed will required 30% less memory and run 7-10% faster. This compression takes place in several phases, most of which are optional. The features of XCOMPRESS are as follows:-

1) remove remarks
2) remove irrelevant blanks
3) remove irrelevant tab characters
4) remove extraneous colons
5) remove LET
6) remove quote marks at ends of lines
7) remove 'GOTO' after THEN/ELSE
8) reduce all variable names to 2 characters
9) remove non executable code
10) replace typing characters where user has already defined DEFXXX
11) merge multiple statements into single lines
12) renumber on a 1 × 1 basis

As can be seen from the above descriptions, this is an extremely comprehensive and useful utility for anyone programming in Basic on the Model II computer.

HOST/TERMINAL — A MODEL II COMMUNICATIONS PACKAGE

Normally when computers communicate together over a modem or by direct connection, it is a purely communications exercise with one computer transferring to the other what ever information or data is required. Although this program may be used for this purpose, it is primarily intended as a remote software service for Model II systems. In other words, one computer can control another in the full sense of the word. If, for instance, the Break key is hit at the term command, then a Break in program run or whatever will occur at the HOST end. Another practical application might be a multi-terminal data/enquiry system. Normal operation at the HOST site will usually involve the SETCOM program with TRSDOS on the Model II. This will be required to support screen positioning sequences which will be transacted. HOST/TERMINAL is loaded in DOS at the HOST computer and, as long as there is not a good carrier from the modem, HOST/TERMINAL will stay dormant and the operator will never know that it is on. When communication is required, the remote station must issue the same SETCOM and invoke TERM. The telephone or direct connection must also be established of course. When this has been done, the HOST station will slow down to the speed of the modem and both keyboards and both video screens will be active and interactive. A useful feature is that the TERM station now has two Break keys (the other one is Control 6). One will Break his machine and return him to TRSDOS and the other will be transmitted as a Break sequence to the HOST station. Transmission rate will normally be restricted to the speed of the modem, but with a direct connection, speeds of up to 9600 baud are fully supported. A subset of the HOST program is also supplied on the disk called DUMBHOST. This does not attempt to transmit the screen positioning sequence and can be used with any ''Dumb'' ASCII terminal such as the Model I. A further utility HOSTOFF is supplied to permanently disable either HOST or DUMBHOST. It should be noted that the DOSFIX program mentioned above, which is supplied free on all Snapp Inc. disks, must be utilised. In particular, the eight patches contained therein, which move the Break key, must be implemented.

FRIEND — A PROGRAMMER'S FRIEND

This suite contains four programming aids for the Model II. They are built around a new system of file naming which is fully explained in the manual and is not relevant to this description. What are important are the four aids which the suite will carry out. The first is the facility to provide hard copy listings of Basic programs from DOS, regardless of whether they were saved in ASCII or compressed format. By reason of the file nomenclature, the program has the ability to list all programs with a common section of the file name. For instance, it is possible with one command to list all files on a specified drive with the extension ''/BAS''. The second facility enables the user to display information about what files are located on what disk, the dates of creation and (very usefully) the date of the last update. The information may be displayed on the screen or sent to the line printer and again a large number of files with common parts in their names may be displayed with one command. The third aid enables the user to kill a group of files from his disks. Once again, the advantage of the program is the file nomenclature which enables a large number of files to be killed at one command. Options are given throughout, incidentally, if the user wishes to change his mind. We feel that this particular facility only provides marginal benefits over the normal PURGE command in TRSDOS. The final function is the ability to move, that is to say, to copy one or many files to one or multiple disk drives with one command. This is probably the most useful function particularly when the user is re-organising his disks. Pretty well any part of a file name can be changed when the copying is made. For instance, with single command it is possible to copy all files with the ''/BAS'' extension on one drive to another drive and give them a different extension. We feel that we should emphasize that this program is really only for users who are operating their machine for substantial lengths of time. All of the functions can be performed in one way or another with normal TRSDOS commands. The appeal of the program is the ambiguous format in which file specifications may be stated which enables the user to carry out a number of operations with one entry from the keyboard.

TERMINAL PATCHES – PATCHES FOR TERMINAL AND OTHER UTILITIES

In the Model II TRSDOS is a TERMINAL program. The purpose of this program, of course, is to enable Model II to communicate with other computers, usually through a telephone modem, but also by direct hook up. In the main this program works very well, but severe difficulties have been experienced when using it to enable the Model II to communicate with various computer bureaux. Accordingly, Associated Nuclear Services have written a number of patches which, when inserted in the TERMINAL program, will circumvent the problems. The specific problems which the A.N.S. patches correct are, firstly to prevent the clipping of the first transmitted character when using the wait prompt option; secondly, to prevent lock out during file exchange with bureaux which append CTRL-S as end of text characters, which TERMINAL interpretes as ''ignore everything until CTRL-Q is received''. As this, of course, never is received, the machine hangs up; thirdly, noise on the line can lock up the Model II in parity error. Subsequent characters are correctly received, but each is printed on the screen preceded by a reverse P character. It is believed that Tandy just now have a patch for this situation and indeed it may be included in the DOSFIX mentioned herein, but at this time it is not known whether it is or not. In addition to the patch program, there are two other Basic programs included on the disk. Data files can be built using the Basic AUTO command and then edited using the normal Basic edit facilities. Certain difficulties arise, however, regarding the line numbering (which are explained in the instructions), but before the data can be transmitted using TERMINAL, the line numbers must be removed. This is the purpose of the first Basic program FH1A. The other Basic program, FH2A, carries out the opposite process by adding line numbers to a received program. Finally, a small program is also included on the disk which is called by the AUTO start up command, which reminds the user to hit the CAPS button, which inevitably most users forget!

HINTS AND TIPS SEPTEMBER 1980

The big news this month is the unveiling in the United States of three important new Tandy computer products, namely the Model III, the Colour computer and the Pocket computer. Funnily enough, in the new U.K. catalogue, only the Pocket computer is listed so presumably there is going to be some delay before the Model III and the Colour computer arrive. The Model III seems to be (although is not so described in the U.S. literature) a re-packaged Model I. It is similar in appearance to the Model II, but uses 5" disks. The console, therefore, has room for two disk drives, rather than one on the Model II. It is a self-contained console and the keyboard does not appear to be detachable. It supports upper and lower case and rather interestingly, the cassette loading has been increased to 1500 baud. The loading, therefore, is three times as fast as the Model I. Software compatibility with the Model I is claimed and although the literature is a little ambiguous, it would seem that the Model III has Level 1 Basic capability, in addition to what is called ''Model III Basic''. The latter presumably, in view of the software compatibility, is the same as Level 2 Basic. The disks are double density and have a capacity of 175K characters per data disk. A real time clock is included. The bottom of the line is a 4K Level 1 selling in the States for $699. The ''standard'' version is 16K at $999. Presumably neither of these include disk because the two disk 32K system with an RS232 interface is $2495. 16K RAM kits sell for $119. The colour computer introduces a departure for Tandy marketing strategy in that in addition to being cassette compatible, it will also load ''Entertainment Cartridges''. It is supplied as a keyboard alone so that the user can hook it up to his own colour TV, but a colour video is also available. It is obviously aimed at the games market, although it presumably has some built in Basic ROM, as an ''Extended Basic Add-on'' cartridge is listed as an accessory. Our guess is that it is aimed as competition for the Texas Instruments 99 machine. In appearance it is somewhat similar to the Apple. The bottom of the line machine costs $399 and has 4K memory. The version with Extended Basic and 16K is $599. Emphasising its application as a games machine, Tandy are supplying dual joysticks as an accessory. As we understand it, neither of the Model III or the Colour computer are available in the stores in the United States, but are expected there around the end of September. The Pocket computer sells in the U.K. at £119.Tandy were kind enough to lend us a specimen at the recent PCW Show and we can indeed confirm that the machine can easily be carried in the pocket. Indeed its size is probably one of its most amazing features when you consider that it is a computer in the full sense of the word, complete with a ''QWERTY'' keyboard and Basic compatibility. The U.K. version has 1.9K RAM. The liquid crystal display has 24 characters. Memory is non volatile, that is to say you can switch the computer off without losing the contents of the memory. Bearing in mind its size, the resident Basic interpreter is extremely versatile and supports most of the normal Basic functions. In power, it might be placed somewhere between Level 1 and Level 2. It is a fascinating machine to use. Despite Tandy's statement to the contrary in their manual, the machine does bear a strong resemblance to a programmable calculator and we imagine will find its market as a superior programmable calculator capable of being programmed in Basic.

There is considerable confusion around regarding the current Model I's presently being issued by Tandy which contain a new ROM. First of all, you can tell whether or not you have the new ROM very easily because the titles, on power up, will be abbreviated. For example, ''Mem Size'' instead of ''Memory Size''. To all intents and purposes the new ROMS are perfectly compatible with software written for the old ones. The chief purpose of the new ROMS, of course, is that it is not necessary to have any keyboard debounce software in the machine when using them, as a delay is automatically inserted by the ROMS. Any tape made from a Master which was spawned by a machine containing the old ROMS will run with the new ROM. All of the software which we produce on cassette is so spawned and so will not present any difficulty. The only small problem arises with some software, particularly we believe with Tandy's the Master for which was produced in some other way. We have had some difficulty with the Editor/Assembler plus, but this is the only program of ours in which the difficulty has arisen. We are not quite sure what the problem is, but our opinion, for what it is worth, is that it is something to do with the leader of the tape which normally consists of a block of zeros. The tapes that we have investigated which do not run seem to have a shorter block. If you experience any problems, it is only necessary for the offending tape to be re-copied off a machine containing the original ROM for it to be made loadable with the new ROM.

We are getting a large number of requests for information regarding a suitable sound box for the Model I. We would recommend the Tandy telephone amplifier, catalogue no. 43-231A, obtainable from any Tandy store.

A FEW ODDS AND ENDS TO NOTE

Sometimes in the computer business the most simplest of accessories are difficult to obtain. We were continually trying to find spare cardboard sleeves for our 5" diskettes. At one time we were convinced there was a ''sleeve-eater'' around in the office! For our own use, therefore, we have started to have the sleeves manufactured and printed and in case other users have had the same experience, we can offer these for sale at ten for £1.00 plus VAT and P & P.

Mr. Frederick Brown of Hull wishes us to mention that he has started Forum-80 in the U.K. This is a free bulletin board service run for the computer hobbyist. It may be used for leaving messages, hints for other users, requests for help and so on. Items for sale or wanted may also be listed. Connection to the bulletin board is over the telephone via RS232C interface and a phone modem. Smart Terminal, or another similar program, will also be required. Forum will be available on Thursday evenings between 7p.m. and 10p.m., Saturday from 12.00 noon to 10.00p.m. and the same hours on Sunday. Mr. Brown tells us that other times can be fixed by arrangement with him. The telephone number is Hull, for which the STD code is 0482, 859169.

The registered business name of A.J. Harding (Molimerx) was originally chosen for this Company in preference to forming a limited company, so that customers would have confidence, not only in our integrity, but also to emphasize the personal service which we intended and have carried out. For accountancy reasons, however, it has become necessary to form a limited company and this has been done in the name of Molimerx Limited. I would like to emphasize that although advertisements and other literature will contain the new Company's name, they will also contain the name of the original firm so as to emphasize our particular policy of business. Indeed, the two entities will be continuing on a ''hand in hand'' basis. Whilst on the subject, a number of customers have asked us how the name ''Molimerx'' came about. The Latin word for soft is ''mollis'' and the latin name for ware is ''merx'' - hence, Molimerx!

CHRISTMAS LISTING

In our Christmas Listings we always try to concentrate on games and similar programs, and you will find a good crop in this Xmas 1980 list. Do not however, miss the more serious programs listed!

Genie users should note that from hereon in the catalogue, incompatibility of 16K Level II TRS-80 will (unless we forget!) be mentioned in the program description. In other words, if the Genie is not mentioned then so far as we know at the time of going to press, the program is compatible.

INTERACTIVE FICTION — YOU ARE ACTUALLY IN THE BOOK

This set of programs represents an entirely new approach to computer software. It is in some ways similar to the Adventures and it is not surprising that it comes from Adventure International. It is not written by Scott Adams, but by Robert Lafore, a writer and columnist. Interactive Fiction is story-telling by way of the computer so that you, the reader, can actually take part and take a place in the story instead of merely reading it. The scenario is set by the computer with a fictional situation which you read from the VDU. You then become a character in the story and when it is your turn to speak, you type in your response. The dialogue of the other characters and even the plot will depend on what you say. It is hard to say whether these programs are games in the true sense of the word or not. They are certainly extremely enjoyable, but by definition the rules of a game are rigidly defined. Even in the Adventures there are only a limited number of responses. With Interactive Fiction you can say anything you like to the other characters. Obviously there are some limits to this. Anything too bizarre may not be understood. The programs are hard to explain. Perhaps a good way would be to say you are taking part in a stage play, where although the general plot has been decided in advance, one of the actors starts to ad lib. Obviously the replies of other actors would thereafter, as set in the plot, not make sense so they have to start to ad lib as well. A brief resume of the stories which are presently available are as follows:-

Local Call for Death. This is a detective story rather after the style of Lord Peter Wimsey. It is a challenging story and one that will require a considerable amount of analytical skills and social know-how.

Two Heads of the Coin. The psychological mystery set in the London of Sherlock Holmes. Most people will find that observational skills and imagination will be the prime requirements for this one.

His Majesty's Ship "Impetuous". A straight sea adventure rather along the lines of Hornblower and Kent. You will be back in the days when His Majesty's Navy roved the Seven Seas. Pirates, plunder, fame and fortune await the intrepid captain.

Six Micro Stories. These stories, which are all on the same disk are primarily intended as an introduction to Interactive Fiction. It contains six very short stories which involve you in a variety of situations stretching from an American spy in Hitler's Third Reich to a pilot in a doomed 747.

All Interactive Fiction programs are available on disk only. At the present time for the Model I, but a compendium for the Model II will be available shortly.

ZOSSED IN SPACE — MACHINE LANGUAGE AND SOUND

This is a very long machine language program and actually occupies aroundabout 15K of Z80 code. As it does not use any ROM calls, it will run on either Level I or Level II. The game is a simulation of command of an operational starship and contains no less than 40 audio sound routines. Having been written in machine language, the program can make extensive use of the high speed, fast action graphics capability of assembly code. The main objectives of the game are firstly to accumulate 100 trading units and secondly to destroy 10 enemy ships and finally to survive 100 sectors of space. Actually, the primary objective of the game is to actually stay alive. The space scanner or exterior view is composed of an entire video page and uses graphics instead of symbols. The primary direction of travel is up and indeed the game starts with a very nice picture of what one assumes is an Apollo spaceship blasting off. The cursor keys are used to guide the ship, hence, at this time, the program is not compatible with the Genie. There are 20 different types of sectors, each of which provides its own unique obstacles to your journey. Whilst travelling through space, you can change your view from a graphic representation of space to the main control desk inside the ship. The console provides you with all the information you require. The rules are reasonably complex and we will not go into them herein. Probably the best description of the game is that it lies somewhere between Galactic Trader and Star Trek, but with the big advantage of having been written in assembly code.

FOX & HOUNDS — A NICE STOCKING FILLER!

This is a nice little program that has been adapted to the TRS-80 (with permission) from an article which originally appeared in "Computing Today". It is played on a chessboard between a fox and two, three or four hounds. The player controls the hounds, and the fox is controlled by the computer. The purpose of the game is for the hounds to either corner the fox or trap him against the side of the board. If they do then the player wins, if the fox gets through to the bottom line then he wins. Feeling as we do about fox-hunting we rather hope that the fox makes it every time. Unfortunately, with three or four hounds, the odds are very much against him, but when only two hounds are chosen, the odds are a bit more even. The graphics are good and a nice little touch is that the dogs can face either way! All in all a compact, fun game.

CUBE HUNT — A PICTORIAL WORLDWIDE SEARCH

In the world there are hidden eight separate segments of a cube. Your mission is to find and collect them. The game is played against an excellent graphic representation of a map of the world divided into two. The first shows the continents from the British Isles to China and the other overlaps the first showing the British Isles again and the west side of Africa and Spain and stretches westerly to Alaska. The map scrolls automatically as you travel the globe. One of the very real additions of this game over the one or two similar ones that we have seen is that it will change every time you play it. Each continent has three separate cube positions and three ports of entrance and one of these is chosen randomly each time the game is run. The cursor arrows are used to guide yourself about the world (a Genie modification will be ready very shortly) and to find each cube segment you must attempt to dock at a specific port on a specific continent. In the first instances no clues are given, but as your failures mount up you may be thrown a crumb of a clue. Actual attempts to dock at various points on a continent must be made. It is no good just cruising by! Damage can occur to your craft for various reasons varying from storms to shark attacks and if this damage exceeds 50, you sink. The left hand ten columns of the screen are reserved to continuously show you your X and Y co-ordinates at any given time together with the damage estimate and the number of cubes you have collected. It is in this area also that it is reported to the player the position of the game, details of attack and any clues. Having docked at a continent the display shifts to a map of the land mass and somewhere the cube segment is lurking. You must find it and then return to the sea to continue your search. So far as we have been able to ascertain, at the time of going to press, Cube Hunt is compatible with Disk Basic.

CHECKER KING — ANOTHER DRAUGHTS PROGRAM

We already carry an English written Draughts program, which is described on page 35 of the catalogue so it was with a great deal of interest that we staged a tournament wherein this Personal Software Checker King played against Draughts. Unfortunately, it was a little bit of an anti-climax because invariably they played at almost precisely the same skill level. In other words, the result of the tournament was a deadheat! It is therefore to the facilities of each program that one has to look for a comparison. There is no doubt in

our minds that the graphic display and the ease of input is superior to Draughts. On the other hand, Checker King has some features that Draughts does not, such as being able to take back a move and set up a position. It also has a "bonus" of rather doubtful value, namely that three puzzles are available to the player, but only at the start of the run. If one starts to play again then it is not possible to access the puzzles. All in all, therefore, it seems that the two programs are more or less equal and provide an alternative to each other.

ANIMATION — A MAJOR NEW PROGRAM

Animate is a machine language program representing an entirely new breakthrough in the use of graphics on the TRS-80 or Video Genie microcomputers. As Walt Disney and others found to their profit some years ago, if you draw a number of separate pictures slightly different to each other, and then display them consecutively sufficiently fast, a moving picture is produced. This is precisely what Animate does. Pictures are built up as a sequence of frames, each one being as small or as large as you wish and composed using an easily used graphics cursor. The entire graphics content of a frame can be shifted in any direction so as to move objects without the need to redraw them in each new position. As each new frame is completed it is automatically stored in memory and given a number, so that it may be recalled and edited at will. The timing of the projection of each frame is definable up to a maximum of 100 seconds.When the picture is completed, it may be viewed and edited as you wish. When the final picture is complete it may be stored on cassette as a SYSTEM program. Thereafter, it may be loaded and accessed either by Animate or by any Basic program. Thus the same picture may be used in any number of different Basic programs, if you wish. Animate has a large repertoire of commands. In the list which follows, the word "sequence" is used to mean the collection of frames or pictures which have been composed. The commands are as follows:-

1. Dump the entire sequence to tape for future use either with Animate or as a sub-routine for a Basic program.
2. Load sequence from tape which has been dumped under the command above.
3. Frame set. Set the size of the frame required.
4. View the entire "movie", that is to say, run the entire sequence on the screen.
5. Clear the screen or the current frame.
6. Single step backwards or forwards through sequence.
7. Quit the program and go to Basic.
8. Clear the sequence and re-start with a new one.
9. Enter graphics mode whereupon a new series of commands is available to enable the user to easily draw the pictures.
10. Kill the current frame.
11. Jump to another frame in the sequence.
12. Set the time period that the frame is to appear on the screen (up to 100 seconds).

In addition to the matters mentioned above, any frame may be set to reverse graphics, that is to say black on white instead of white on black. Throughout the time that one is working on a sequence, all vital statistics are available for display on the screen. These consist of the number of frames that have been stored, the current frame number, the current frame size and the memory size currently set for Basic. When the "movie" has been completed and saved to tape, it may very easily be used within a Basic program. All that is necessary is to insert the command X = USR(O) at the desired point in the Basic program. Note that it is not necessary to set memory size for the tape, nor is it necessary to enter the sub-routine start address. This is all done automatically by the tape when it is fed in. An added bonus with Animate is that two other items of software are suppled with it. The first is a pre-written sequence showing a Lunar Lander coming down to the Moon's surface and the second is a Basic program in which this sequence is used. Effectively, therefore, the customer is getting a free Lunar Lander program thrown in! More importantly, the Basic program shows very clearly how the sequence is called from Basic and how easily this is done. Although a Lunar Lander example is perhaps not the "cutest" of subjects for an animation sequence, it does show how Animate can be used to improve graphics which are quite common place for the TRS-80. In particular, note the way that the exhaust shape and type changes, depending on the amount of thrust used. This is probably one of the most important pieces of software that we have had the pleasure to introduce for the TRS-80 and Genie microcomputers. A separate version incidentally is available for the Genie and customers should state in their order that they require the program for that machine, as otherwise the TRS-80 version will be shipped. There have been a lot of graphic programs for the TRS-80, but none we think of this quality. As stated in the first line of this write-up, Animate constitutes a completely new breakthrough. Cassette for Level II or Genie machines with 16K or more memory or disk for 32K. A comprehensive manual is supplied.

Note to 1982 Catalogue Re-write

A substantial update was carried out to Animation which contained various small improvements, but the main one is that the user has the option to display the movie sequence anywhere on the screen. Hitherto the sequence was displayed exactly as it was stored. This option is still available and the new facility of being able to display anywhere on the screen, regardless of where the sequence was "compiled", is additional. Wrap around is not permitted so it is now possible to display parts of pictures. An extremely valuable by-product of this new function is that it is now possible to compile a single frame and move the contents of that frame anywhere over the screen as many times as you like from within the Basic program. In other words, quasi-movements can be obtained with only one frame compiled. Compatibility with earlier versions is maintained for the disk version, but not with the tape. In other words, tapes produced from the previous tape version will not run on the new one.

TREASURE QUEST — BEWARE THE STORMS AS YOU HUNT

You are the captain of the sailing ship 'Zombie' in the year 1760 and you have sailed to a remote corner of the world called the Blood Straits. Your purpose is to find the treasure which is hidden there, either under the sea or on one of the islands. You can explore the Blood Straits, a chart is provided, under sail or by rowing the ship's boat. The boat must be used for exploring shallow areas, particularly at low tide and for going ashore to explore the islands on foot. It is a dangerous area with shifting winds, shoal waters and frequent storms. A degree of seamanship may, therefore, be required. To find the treasure you will have to explore carefully. You can, of course, dig or dive for the treasure as often as you wish, but before doing much exploration, you will have to try and find some clues because the only knowledge which you have at the start is that the location of the treasure is somewhere in the Blood Straits. To add to the fun, pirates are also in the Blood Straits looking for the treasure, although this can be turned to your advantage if you can find out what they know about its location. The British Navy also has units in the area looking for the pirates, so watch out, you can easily be mistaken for them. Even on board ship you must take care because you do not trust your crew and they do not trust you. To add to the joys of treasure hunting, the hurricane season is rapidly approaching and the Zombie cannot stand up to such a storm, even with the best of handling. There are one or two points in your favour. The chart is good with plenty of accurate soundings and other important features. You have a good navigator to provide instant and precise navigational fixes. You will also be told instantly of all shifts in the wind, so that you may evaluate the position. To find the treasure you will need perseverance, good seamanship and some luck. Commands are entered in "English", for instance if you wish to sail 45° for 3 hours, you merely type in SAIL 45/3. There are a large number of these commands available. The game is available on tape or disk and seems to us to be, despite perhaps its frivolus title, a major game.

DATA MANAGEMENT SYSTEM — ANOTHER DATABASE MANAGEMENT PROGRAM

At the moment we carry two database management programs, one entitled "Database Management" and described on page 20 of the catalogue and the other "Protext" described on page 24 of the catalogue. The former is a fairly simple and straightforward program which offers database management facilities for both cassette and disk. The latter is a more complex program, which is disk orientated, but does need a fair amount of operator skill to run it. This CCA Database Management System (DMS) combines the extended facilities of Protext with the ease of operation of the first program. DMS is extremely versatile and may be used just as easily for financial matters

such as accounts receivable and accounts payable as it can be used for, say, names and addresses in a mailing list. It comes with a 130 page manual in a small loose-leaf binder, which contains very full and complete instructions for the running of the software. Indeed if there is any criticism of that manual it is that it is probably too full and complete. Quite a few of the first pages of it can be passed over by even a partially experienced operator. The description of the original Database Management on page 20 of the catalogue contains fairly complete details of a database and all of the general remarks therein apply to this current program and they will not, therefore, be repeated at this time. However, so that you will understand the following comments we would remind you that a database is comprised of a number of files and each file is split into a number of records and each record is split into a number of fields. Hence, if one uses the example of a mailing list, the list is the file, each record contains all of the details for any particular person and each field within the record contains specific details of that person such as name, first address line, second address line and so on. The general features of DMS are as follows:—

1. The fields may be alphanumeric, numeric, integer, floating point or fixed decimals with commas.
2. Fields may be computed fields. DMS will compute any field within a record using constants or indeed other fields in the same record. Mathematical functions include add, subtract, multiply, divide and raise to exponential powers.
3. Individual records are easily located with DMS using the SCAN feature. Records may be scanned with a field over, below or between a range of values.
4. Records are, of course, easily added.
5. Multi disk capabilities are available for larger files up to 85,000 characters per file.
6. The records may be sorted into almost any order using up to ten fields as a key. Taking the mailing list example again, therefore, one can sort by customer name, or by postal code or by town or indeed by almost any other parameter.
7. Records may be deleted and compact files may be made by running a particular option, the effect of which is to delete all blank records.
8. Reports or hard copy may be generated with records in any order and with any fields to be printed.
9. Mailing labels may, of course, be printed.
10. Numeric totals and sub-totals can be specified when a value in an unrelated field in the same record changes, for example, sort, sub-total and print according to department or month or customer number.

What the above features really amount to is that this is a far-reaching and versatile database program which, because of its supporting documentation and understandable computer prompts, is easy to use. You can essentially create a file of any information whether it be financial or otherwise, have instant access to it and the facilities to sort, update and so on as described above. One of the features that we particularly like in it is concerned with the SCAN feature. Normally when one searches or scans a database you enter in the parameter which you wish to search and the database comes back with the record in question. An option with this program is to just display the number of the record and then (and this is the feature which we particularly like) the program displays the percentage of the file in which this particular parameter appears. It seems to us that this could have many applications, perhaps the most obvious one is if the database is being used for accounts receivable and there is a field which shows whether or not the account has been paid. With the SCAN feature described, the user can have immediate access to the percentage of his accounts which have been paid. Another nice point is to do with the sort routine in that the program will make an entirely new file of the sorted date, that is to say, you can optionally finish up with two files on your disk, one sorted and one unsorted. We were only able to come up with two criticisms of any value. The first is that presumably in order to make the program as crash proof as possible, the files on the disks are closed quite frequently. This, of course, slows down disk access to some small extent, but does have the big advantage for inexperienced operators that if the program is broken in the middle of a particular function the odds are quite good that the file won't be crashed out. The second point is that for some reason best known to themselves, Personal Software have elected to distribute this disk orientated program in the form of a cassette. Hence, before the program can be used, it is necessary for the operator to transfer the program from cassette to disk. This is no particularly great problem as they are all written in Basic, but there are seven programs in the suite so it is not particularly an awe-inspiring chore to carry out. The quality of the cassette is extremely good and we did not experience any loading problems at all. We tried a tape out on the new ROM machine and this also loaded in, but it seemed to us to be somewhat more critical. We have, of course, had to put the programs onto disk, so as a service to customers, if anyone would prefer to receive the programs on disk in addition to the cassette, then we can supply this at a nominal charge of £3.00 plus 45p. VAT. Incidentally, the programs are not only written in Basic they are also written in an "expanded" form and are quite liberally sprinkled with REM statements. Hence they are quite easy to modify if any user desires to do so.

STARFIRE — A SPACE SHOOTING GAME

If you like shooting games then this one will appeal to you. It is written in machine language for fast action and can be played either against the computer or by one player against the other. There is little that can be said about the game. The players fight it out across the far reaches of space, not only against each other, but also against the clock. The one with the highest number of kills, wins. The action is fast and furious and the graphics are very good, in particular the manner in which the closing scores are displayed.

FROG — A STRAIGHTFORWARD FUN GAME

The tendancy nowadays seems to be towards more and more complex games and it is rather refreshing to find one which is unashamedly straight fun. It is, in many respects, very similar to Beewary. Essentially you are a hungry frog, sitting on a log in the middle of a pond and you are trying to catch your dinner on the "fly". The graphics are excellent and sound is included. There is not much more that we can say about this game, but do not let the brevity of this paragraph put you off from buying it. It should be super Christmas fun. As we go to press, this program is not compatible with the Genie, but as it is so much fun, it is well up our list of priorities and we are sure it will be made compatible by the time this list is published.

YI-CHING — ANSWERS TO DAILY LIFE

Let us get one thing clear and out of the way first of all. Whether any individual person believes in matters such as these or not is entirely up to him, but the program has been written in a serious vein by a Priest of ISIS, who most certainly does believe. The point that we are trying to make is that this is a serious treatise and is part of a series of programs being written as part of the work of the Centre of Matt. Yi-Ching is in functions somewhat similar to Tarot card reading. It is extremely ancient and according to the author easily pre-dates Confucius. The function of Yi-Ching is that the seeker of knowledge may ask any question that he or she desires. In the Chinese traditional method, bamboo sticks were used in order to obtain a hexagram and this is still considered to be the "proper" way to do it. An additional method is to use coins, each one representing a two or a three. Three coins are cast and the sides which are uppermost are totalled. Although the bamboo sticks are traditional, there is no reason why the hexagram should not be cast in different ways and particularly in this case by a computer. There are only four combinations of totals possible, numbering from six to nine. The number six represents a moving YIN line, seven represents a non-moving YANG line, eight represents a non-moving YIN line, whilst the number nine represents a moving YANG line. The YIN is a broken line whilst the YANG is the unbroken line. If a line is moving, it means that it changes after the hexagram is formed into the opposite line and, therefore, forms a second supplementary hexagram. The program takes you through the Yi-Ching in an easily understood manner and it needs no experience or knowledge in order to follow it. The question is written in as a precise manner as is possible using less than 32 letters. When the question is asked of the computer, the user should concentrate when asked to and repeat the question over to himself. The answers are traditional and use such phrases as "to cross the great stream" which would indicate a forward action no matter what hazards are met. The meanings of the answers have been deliberately chosen to be traditional and are entirely interpretive. The author is currently working on another program for the Runes and also on an astrology textbook on cassette. We would be interested to hear from any customers who would like to let us know whether or not there is a general interest in this subject. For obvious reasons, we are unable to accept any responsibility for the results of using this program, nor are we able to accept any liability for whether or not it gives satisfaction.

PASCAL — A COMPLETE PASCAL PACKAGE

This system is intended to provide the Model I TRS-80 user with Pascal program development and execution facilities for all types of Software. The system comprises the following components: Editor, Compiler, Interpreter, Translator and Run time System. The Run time System uses only documented TRSDOS interfaces and has been tested with TRSDOS 2.3, NEWDOS 2.1 and VTOS 3.0. Some TRS-80 ROM routines are used. A 32K system is adequate to compile and run many programs, in fact the limiting factor will usually be the size of the source program that can be handled by the Editor. The system is compatible with either a 32K or 48K machine. This implementation of Pascal uses the Jensen and Wirth Pascal User Manual and Report as the base document and is very similar to the University of California Pascal. Those new to Pascal are advised to use one of the many excellent introductory texts which are generally available. In particular the manual mentioned above which is available from Foyles, although there are many other books on the market. We should point out that this package is not intended to be in any way an instructional one in the use of Pascal. It assumes that the user has at least some knowledge of the Pascal language. There are some restrictions in this implementation, the most important of which are that floating point, labels and GOTO statements are not supported. On the other hand there are a number of extensions, the most important of which are PEEK, POKE, RND, PLOT (SET/RESET), AT (PRINT @) and INKEY. A brief description of the components of the system is as follows: —

EDITOR
The Editor is a straightforward screen-based editor, which produces and accepts as input standard ASCII text files. The format used is compatible with the DOS commands LIST and PRINT and with the Electric Pencil and Scripsit.

COMPILER
The Pascal source program is written in free format and may be composed by using either the Editor supplied, Scripsit or Electric Pencil. Four switches are available as follows: —

C	List or print the generated P-codes.
N	Generate line number P-codes for use by the interpreter.
P	Print the source listing on the line printer.
W	Wait if an error is detected.

The default is to do none of the above.

INTERPRETER
The Interpreter will interpret P- code under user control. The user may set breakpoints, display and change values, trace program flow and so on. The most important interpreter commands are to: list all breakpoints; set breakpoints; clear breakpoints; go to a P- code address; show last line number executed; modify the value of the stack; run the program from the current P- code address; single step; display the trace; display values from the stack and display the program status.

TRANSLATOR and RUNTIME SYSTEM
The Translator reads the p- code form and generates a Z80 program including calls to the Runtime system. The program is written to a disk file in TRSDOS load format. To run a generated Z80 program it is only necessary to ensure that the Runtime System is loaded (typing PASCAL) and then simply typing the name of the filespec of the program concerned.

The Pascal system is suppled, of course, on disk and is accompanied by a twenty-page manual.

Notes to 1982 Catalogue Re-write

An important upgrade was carried out at the end of 1981 taking Pascal to version 4.3. The following is a description: —

The Pascal development package which we stock is described elsewhere in the catalogue. This has now been, to all intents and purposes, re-written and now contains a number of upgrades and enhancements. This enhanced package, incidentally, is available to previous purchasers for the difference in price. This new version is far faster than the previous one. It runs all the benchmarks in Personal Computer World with a considerably better speed value than the UCSD version. Some commands are quite dramatically better. The Forloop, for instance, gives a result of 11 on this present package whereas the UCSD version is 86. Many of the other benchmarks are equally good. This system now provides TRS-80 and Video Genie owners (Model I and III TRS-80 and I and II Video Genie) with comprehensive Pascal program development facilities producing efficient Z80 executable code. It is, of course, a compiling system, not interpretive. It should be noted that a 48K system is now required. The package is compatible with all well known DOS's with the possible exception of Dosplus with which it has not been checked. The language supported is based on the Draft ISO Standard, but is fairly similar to other micro implementations such as UCSD. This 4.3 version includes full floating point facilities. The priority throughout has been to provide an efficient implementation tailored to the Z80 and to the TRS-80/Genie in particular. This has been a prime criteria, even above the chosen objective of supporting the full standard language. Whilst on this subject, the main omissions of the language are sets and records. On the other hand, extensions include equivalents to TRS-80 Basic PEEK, POKE, CMD, SET, RESET, PRINT @, RND, RANDOM, VARPTR, MEM and INKEY$. The components of the system are somewhat changed from the original description on page and are now:

EDITOR
This is a straightforward but powerful screen-based editor, having a file format compatible with Electric Pencil, Scripsit and the DOS commands LIST and PRINT.

COMPILER
This accepts a standard ASCII file as input and produces a standard TRSDOS object file as output. Compiler options include pausing on each error, producing a printed listing, generating line numbers for use in error messages, accepting multiple input files one after the other, and checking for values outside the declared range.

RUN-TIME SYSTEM
Supplied as a command or object file, this contains all the interfaces between your program and the DOS and ROM routines used. Simple instructions are provided for combining this with your program to give a single executable command file.

CRIBBAGE — PLAY THE COMPUTER AT CRIB

This program is a computer adaptation of the wellknown card game of Cribbage. There are a large number of variations of Crib being played, so we should explain the rules of this particular version. The cards are shuffled and cut at the beginning to decide on the first dealer and thereafter dealing alternates until the game ends. Six cards are dealt to each player by the dealer and the dealer has the ''Box'' hand. Each player puts two cards into the ''Box'' hand creating three hands each of four cards. The cards are cut and the ''turn up'' card is obtained. If this card is a Jack, the dealer is awarded two points (two for doing it.). The game then progresses to the pegging hand. The first to lay is the non-dealer. Each card is laid alternately, unless a player cannot lay. The pip value of each card as laid is added to the total of those laid and cannot exceed thirty-one. Upon reaching the closest to thirty-one, the series is discarded and a new one started until both players' cards have been used. The ''Box'' hand is not used in pegging. The scoring we think is fairly standard. A pair scores two points, threes score six points and fours score twelve points. Points are also scored, of course, for four of more consecutive cards of the same suite and for runs. When pegging is completed, scoring of the hands is made. The dealer having the ''Box'' hand always has his score taken last. If at any stage whilst pegging and/or scoring, a player's score exceeds sixty, that player wins. Hence, if a player is four points from winning and is not the dealer, since he has ''first take'' he stands a better chance of winning unless the dealer can peg his way home. Each hand of four cards is used in conjunction with the ''turn up'' card for scoring. The dealer has the ''Box'' hand score added to his own. The pegboard is graphically represented on the screen and playing cards are also represented graphically.

TUNNELS OF FAHAD — AN ACTION GAME

This game is similar to a number of arcade and microcomputer games. It is played on a ''board'' made up of three or four squares within an outer square. The inner squares have ''holes'' in them through which the player's pieces can pass (hence the ''tunnels''). The object of the game is to recover as much silver and ''tanner leaves'' (anybody know what they are?) as possible. Silver will get you 10 points and tanner leaves will get you 20 points. 71 silver pieces in one turn will give you 100 bonus points and a score of over 2000 gives you an extra turn. The mummy (in other words your opponent) is controlled by the computer and the player, of course, controls the other piece by means of the cursor keys. The game should be made available for the Genie by the time this list is published. Sound is provided.

Personal Software and Acorn Software

We are pleased to be able to announce that in addition to the exclusive rights which we have for other major United States software companies, we have now been appointed sole U.K. licensee for Acorn Software and in conjunction with ACT, we have been appointed sole U.K. distributor for TRS-80 software from Personal Software. Although we already carry some of the products of both these companies, we will now be carrying the complete lines of both. Unfortunately, the Master tapes and disks will probably not be arriving in time for this list from Acorn Software, but their products will be featured in our next list in January. A number of products of Personal Software are mentioned in this list.

OLYMPIC DECATHLON — A REAL WORKOUT

This is a fascinating new program from Microsoft who, as customers will know, only produce games if they are quite unique and this one certainly falls into this category. It consists of ten athletic events as follows:-

1. 100 meter dash
2. Long jump
3. Shot put
4. High jump
5. 400 meter dash
6. 110 meter hurdles
7. Discus throw
8. Pole vault
9. Javelin throw
10. 1500 meter run

Obviously, taking part in these events differs to some degree between each event. They are all graphically represented on the screen and we will briefly go through how the competition for each one is carried out.

100 meter dash: Two competitors may take part and the event is ''run'' by pressing two keys alternately as fast as you can from the start to the finish line.
Long Jump: You take a running start from the lefthand side of the screen, plant your take-off foot just before the take-off line and release your jump at a specified angle to jump as far as possible.
Shot put: You will attempt to throw a 16lb. metal ball as far as you can using an overhand throw. Each player gets three attempts. The top part of your body is graphically drawn on the screen and you hold down various keys to lift and extend your arm.
High jump: The object of the high jump is to propel yourself up and over a crossbar set at a given height. Each time one height is successfully cleared, you will be offered the next. Three consecutive tries are allowed at any given height.
400 meter dash: Similar to the 100 meter, but longer!
110 meter hurdles: In this race, you will have to jump ten evenly spaced obstacles. The run is controlled by alternating two keys. The longer a key is held down, the higher and longer your stride will be.
Discus throw: Your aim is to gain throwing momentum by turning and then releasing the discus so that it lands between two lines that radiate out from the circle. The space bar initiates the turn and the Enter key releases the discus.
Pole vault: This is probably the most skilful of the events in the Decathlon. You must make a running approach, plant the pole in the small vault box, raise yourself using the pole, extend yourself over the crossbar and then release your pole to fall into the foam landing area.
Javelin throw: In this event, you take a running start, run up to the ''arc line'', tilting the javelin into a throwing position as you run and then releasing it.
1500 meter run: This is not only a speed trial, but also needs endurance. Pressing two keys alternately for four laps of the course, it will require quite a degree of endurance!

We would like to emphasise that the graphic content of this program is extremely high and it is hard in words to describe the fun that can be had from playing. It is available on both disk and tape. The tape version is split into two programs containing five events each.

MODEL II

ADVENTURES — YES, THAT'S RIGHT, FOR THE MODEL II

Ever since the Model II was released in England some months ago we have received a large number of requests from users for games for this machine. These have not been generally available as the Model II is always considered, at least at its inception, as a business machine and a demand for games for it was not anticipated. Almost without argument it can be stated that the most popular and best game for any microcomputer has been the Adventure game. In particular the versions implemented by Scott Adams have been universally accepted. It is, therefore, with great pleasure that we are able to announce the availability for the Model II on one disk of all nine of the Scott Adams Adventure games. These consist of the following:-

1. Adventureland
2. Pirate's Adventure
3. Mission Impossible
4. Voodoo Castle
5. The Count
6. Strange Odyssey
7. Mystery Fun House
8. Pyramids of Doom
9. Ghost Town

These nine adventures are available on one disk only. We are not able to supply them individually for the Model II.

Rather out of context, we should mention that a Job Log may be kept, that is to say a log is kept of commands and the time at which they were entered. This may be examined as required.

LBASIC

LBASIC is an enhancement of the Microsoft Basic and is constructed as previously described. It is called in a highly convenient manner very similar to Newdos, that is to say a single line entry with automatic execution of any Basic command. Indeed some of the functions of the enhancements are very similar to Newdos — although not the first four — so we will list them very briefly.

Random Files

In addition to the open ''R'' syntax, OPEN''RN'' will return a ''FILE ALREADY EXISTS'' message if indeed the file does exist. In other words, this parameter stops LBASIC from opening an existing file. OPEN''RO'' will open an existing random file. To either of these new commands, a logical record length may be added. The normal OPEN''R'' function is exactly the same as previous DOSs and will assume a logical record length of 256. Similar opening options are available for sequential files and the Newdos ability of adding to sequential files without bringing all of the file into memory is also available in LDOS.

Abbreviated Commands

Single key stroke entries for AUTO, DELETE, EDIT and LIST. These are identical to Newdos as is the use of a fullstop to list the current line, a comma to edit the current line and the cursor arrows as follows: —

Up	To display the preceding Basic line.
Down	For the following Basic line.
Clear and Up arrow	Will cause LBASIC to display the first line of the program.
Clear and Down arrow	For the last line of the program.

Single Step

This new feature allows the LBASIC programmer to step through each program statement singularly with a hold after each step.

Systems Commands (CMD)

Newdos extended the use of this command from the simple usage in TRSDOS. LDOS, in turn, now extends further. The new command functions over and above Newdos + are:

CMD''O''	Turns off the Break key entry to DEBUG.
CMD''P''	Sends the current screen display to the printer.
CMD''N''	Renumbers the LBASIC program.
CMD''X''	Is a variable and line number cross-reference utility.

The latter two are similar respectively to the Newdos command RENUM and REF.

A particularly useful addition to the renumbering utility is the ability to skip error lines. Many renumbering routines will not renumber a program that has an undefined reference in it and one has to go to the trouble of inserting dummy lines. The cross-reference utility enables the cross-reference of: all variables, only the variables specified, of line numbers or only the line numbers specified.

LDOS contains, unlike almost all of the previous DOSs, an extensive section of technical information which deals, amongst other things, with the following subjects: —

Device control block, drive code table, directory records, disk input/output table, entry points, error dictionary, file control block, file formats, filters and drivers, memory map RAM storage areas, system overlays.

LDOS is completely supported by ourselves and by the authors, Logical Systems Inc. For the first year after purchase this support is availabe free. The following are subject to an annual support fee. Additionally, a quarterly newsletter is sent to all registered owners of LDOS. This software is supported as no other software for the TRS-80 or Genie has ever been supported.

Note to 1982 Catalogue Re-write

At the end of 1981 LDOS 5.1.1 became available for the Model I, the 5.1.0 always having been available for the Model III. Added features are as follows: —

LDOS — NOW 5.1 FOR THE MODEL I

The 5.1 version of LDOS is now available. Our stock has switched over completely and from the end of December, 5.1 has been shipped rather than 5.0. The 5.1 has always, of course, been the definitive version for the Model III TRS-80. Updating information is contained in the LDOS newsletter volume 1, no. 2, issued in October. The procedure is as described in that publication with the exception that the manual and disk should be sent to us and not to the United States. The new disks (yes, the system is now so big that you get two disks!) and the new manuals are despatched from the United States. The advantage of being able to send the manual and disk to us, of course, is that the user is saved the expense of air mail postage to the U.S.A. You must, however, pay the cost of shipping from the States to England, which is $20. The base price for the upgrade is $25. To the sum of these two figures, namely $45, must be added $8 for every month or part of a month that 5.0 has been owned. To recapitulate, therefore, the normal procedure if you wish to update is to send in to us your manual, your original 5.0 disk, together with a remittance calculated as described above. The exchange rate for the sake of convenience is being taken as $2 to the pound. There is some misunderstanding regarding an alternative method mentioned in the newsletter which endeavours to get round the customer being without his manual. The idea was that the disk only should be sent in and then a postcard would be sent from Logical when the shipment was ready to go to the particular customer. He would then be sent his manual. This, hopefully, would leave him without it for a shorter period. However, events have rather overtaken this proposition because Logical Systems are shipping the upgrades immediately they get word from us. Normally we are on the telephone to them once or twice a week and we pass along serial numbers and names and addresses in those conversations to save time. Anyway, the net result is that the turnaround time is extremely fast, so time would be now lost by not sending in the manual to begin with.

Having given all the details of upgrading, we would like to emphasise that this is not in any way, shape or form a mandatory upgrade. 5.1 for the Model I is an entirely different system to the 5.0 in the sense that new manuals, serial numbers and warranties are issued and as we mentioned above, two new disks. To a large extent, therefore, its purchase should be considered in the context of buying a new DOS rather than upgrading an old one. 5.0 will continue to be supported both by Logical Systems and by ourselves. The newsletter will continue to refer to it and include all relevant information. Updates as and when they are necessary will be made available by us at the old charge. It is by no means necessary, therefore, to change from 5.0 to 5.1. As hopefully everybody will know by now, LDOS is a very sophisticated system. This has the big disadvantage, from the vendors' point of view, in that it is difficult to explain all of the features in a meaningful way. We attempted to do this on pages 63-70 of the catalogue. Unfortunately nobody as yet has come up with a comparison chart or anything like that, so in order to give the differences between 5.1 and 5.0 it would be necessary to go through the whole lot again and this, of course, is not practical. We have available a pamphlet describing the 5.1 for both the Model I and the Model III and this is available free on request. We will, however, now attempt to describe some of the differences which come most immediately to mind.

LIBRARY COMMANDS

Some of the facilities and uses of the library commands have been increased and improved, but as a general overall statement the library commands remain much as they were.

UTILITIES

FORMAT AND BACKUP

Both of these utilities, of course, have been considerably changed and enhanced because the system as a whole now supports both double sided drives as well as double density. On Format, for instance, the user is asked whether he wants 1 or 2 sides plus the number of cylinders required. The boot strap stepping rate may also be selected within the range 6, 12, 20 and 30/40 m/secs.

and stored until needed, even if the System is executing an existing command. You are, therefore, actually entering key strokes whilst the System is processing. To give a simple example, if you are very familiar with a program and you know the questions that the computer is going to ask, you can type the key stroke answers in all at one time. Key strokes thus entered may be cleared.

Sysgen
Creates or deletes a configuration file by which the System configuration is set.

Update
This parameter will extend the date function of the real time clock as follows: — at midnight the date will advance one day, the day of the week will be updated and the day of the year will be updated.

Time
Existing command.

Trace
Existing command.

Verify
Existing command.

XFER
This command exists primarily for the single disk system user. Its function is similar to COPY except that XFER will transfer a file from one diskette to another **without** requiring an LDOS system to be present on **either** of the two diskettes.

UTILITIES
In addition to the Library commands, LDOS contains a number of utilities as follows: —

Backup
In essence, this is a normal Backup utility, but it contains a number of enhancements which are too numerous to describe herein. Very generally, the Backup command utilises three different types of backups, namely mirror image backup, backup by class and backup reconstruct. The first may only be done between drives with matching configurations of sides and density. Backup by class is self-explanatory and backups between drives of different configurations will cause a backup reconstruct to be invoked. To further explain:

1. A mirror image backup will do a track for track copy from the source to destination disks. All tracks including the directory and boot tracks will be moved. When this backup is finished, the destination disk will be an exact duplicate of the source disk.
2. The backup by class or reconstruct is actually a mass copy function. The data to be moved will be copied one file at a time. Files existing on the destination disk, but not on the source disk will **remain untouched** by these backups. When these backups are finished the destination disk will contain the same files as the source disk plus any other files that existed on the destination before the backup. The directory and boot files are not copied from the source to the destination disk.

Command File
The LDOS Command File utility is a general purpose disk-to-disk, tape-to-tape and disk-to-tape, machine language program that has been designed to provide the capability of appending two or more machine language modules (CMD, CIM, OBJ files) or SYSTEM tape files, that is to say tape programs that can be loaded with the Basic SYSTEM command. To a large extent, this utility is an extension of LMOFFSET in Newdos, but the extension is so great that this utility really bears little resemblance to LMOFFSET. It is an important utility, the instructions for it cover some eight pages of the manual. We will briefly try to summarise the functions as follows: —

1. Append two or more command disk files or System cassette tape files into one file. This is extremely useful in concatenating two or more blocks of code.
2. Offset a tape or disk file so that it loads into a region other than the original program. A driver routine may be optionally appended to move it back to its original loading routine.
3. Machine language programs from either tape or disk can be appended with patched code to correct errors. This operation, however, requires the use of an Editor/Assembler.
4. Command files can be copied from one system diskette to another on a single drive system.
5. System cassette tape files can be created from blocks of memory. Up until now this feature has only been possible via direct assembly from the Editor/Assembler or a Monitor.
6. The load address range of disk command files may be displayed.

Format
Once again LDOS takes a normal utility and enhances it almost out of recognition and also once again the features are so extensive that we cannot describe them all herein. Probably the one of most interest will be the ability to format to a non standard format. If this option is chosen then the user will be able to define the density, number of sides, number of tracks and the stepping rate.

LCOMM
LCOMM is a sophisticated utility which provides communication capabilities between two TRS-80 systems, between a TRS-80 and a Bulletin Board System (such as Forum-80) or between a TRS-80 and a large time sharing system such as (in the U.S.) Source and Micronet. LCOMM also provides capabilities of keyboard send/receive, automatic spooling and the transfer of files from System to System, **without** the need for hand-shaking when operating at 300 baud. Once again the utility is far more complex than we can describe. It appears to provide all facilities that one could possibly need for computer communication.

Patch
This utility is almost identical to the one in the Model II, with one important addition, the parameter YANK, the effect of which is to remove a patch. The purpose of Patch is to make minor changes or repairs to existing programs or datafiles. In other words, one file is patched with the contents of another.

RS-232
A collection of driver programs used to configure the RS-232 serial devices in the Radio Shack and Lobo expansion interfaces.

JCL
The Job Control Language (JCL) is one of the most powerful features of LDOS. Essentially what JCL does is to allow the user to compile to pre-defined sequences all commands or other key strokes including LDOS commands, user program commands and program query responses into a file. In other words, the user tells the machine what it wants to do at runtime including the posing and answering of questions. The computer will then automatically execute the sequences with no further intervention by the user. It is, in some respects, similar to the COMPROC program described on page 5 of the catalogue although this is a vast understatement and over simplification. Indeed, JCL can be so constructed as to run complete applications without operator intervention. An important feature is that all JCL capabilities which are available at the DOS level are equally available in Basic. Thus a running Basic program can initiate a JCL procedure without problems. Furthermore, when it has been executed the return will be to Basic. To clarify, therefore, the normal application for JCL is to construct a JCL file in which are the various commands, key stroke entries, etc. that you want carried out automatically. This JCL file is then made the subject of a DO command line. Thereupon, the lines of the JCL file are examined line by line and executed as required. Note that the last letter of "JCL" stands for "Language" and JCL is just that. The method of compiling and execution of JCL takes up nineteen pages of the manual and one leaves it to the user, as we said at the beginning, to take the time to thoroughly familiarise themselves with this important feature.

Prot
Existing command. Two important enhancements are available with this command. The first special function is to correct the Hash Index Table allowing the directory to be readable from both LDOS and Basic and the second will correct the number of active tracks on the diskette to properly reflect any number over 35. The two functions may be used to attempt to make non-LDOS diskettes compatible with LDOS without making them unreadable by the System on which they are created.

Purge
This is essentially the same command as is available on the Model II and allows the user to carry out multiple kills of disk files without the need to specify the individual file specs. A feature of LDOS not hitherto mentioned, namely PARTSPEC may be used with this command. PARTSPEC is used in lieu of a normal file spec and may be composed of any combination of the normal four fields defining a file spec. Wild cards are also supported. Thus $$$WAGES will reference JIMWAGES as well as BOBWAGES, etc. Reverting to the PURGE command, a number of switches are available. For instance, the machine can be commanded to question whether or not a kill is required before it is carried out. The command PURGE/BAS:1 would PURGE all files on drive 1 with the extension BAS. The command PURGE:0 which the manual states as a ''powerful and dangerous command'' will PURGE all files including System files from drive 0. In other words, if you use this command you would finish up with a blank formatted disk — a convenient way to clean a disk, but certainly dangerous!

Rename
Existing command.

Reset
This has been mentioned elsewhere and resets the system. When the command RESET alone is entered, all active devices will be Reset. A parameter may be added, however, so that only specified devices will Reset.

Route
This command will re-route all input/output for a specified logical device to another logical device, to a disk file or to a bit-bucket. The latter is computerese for nothing. In other words, any input sent to a device routed to the bit-bucket will simply be ignored and have no output. As with all commands connected with the Device Independence feature of LDOS, ROUTE may be used from a device to a device or from a device to a file spec. Any time that a device is routed to a file spec a File Control Block and a blocking buffer will be allocated in High Memory. If the designated file spec already exists, then the data routed to that file will be appended to the end of the existing file. To write from the beginning of a file, it must first be killed. A new logical device may be created with the ROUTE command and an FCB will be created.

Run
Not to be confused with the Basic command of the same name, RUN is a new command and is used to load and then RUN a machine language application program.

Set
The SET command will set a logical device to a driver program. It does this by loading the specified driver into High Memory (The High Memory marker is lowered to protect it). Once a device is set, any input or output to or from it will be controlled by the Driver routine. LDOS allows the passing of parameters to the Driver program and these are totally independent of the SET command. They are determined solely by the needs of the Driver program. The device Driver program supplied with LDOS will be mentioned later.

Spool
The SPOOL command initiates a spooler function. For details of spooling please see page of the catalogue. The amount of memory to be used by the Spooler buffer may be defined by the user as may be the memory block to be used.

System
The SYSTEM command is an extremely powerful one by which the System may be entirely reconfigured. Amongst many other things, it can be set or change the disk drive configuration, turn on or off various keyboard drivers as well as video and hardware drivers. Thirteen parameters or special commands are available under SYSTEM. Obviously we can only discuss them very briefly herein. It is important to note that most of the following parameters may be used together in the same command line.

Fast/Slow
These commands are used only if a suitable clock speed up modification has been installed in the TRS-80 keyboard. Lobo says in the manual that they are neither endorse nor condemn speed up kits, but effort has been made to support this modification in LDOS.

Alive
This is an interesting one. It displays a moving graphic character in the upper righthand corner of the screen when the task processor (presumably the CPU) is running.

Basic2
Basic2 takes you to Level II ROM — in other words, the MEMORYSIZE? (or MEMSIZE? if you have the new ROM) state.

Break
Enables or disables the Break key.

Blink
Enables or disables a blinking cursor. Furthermore, the cursor can be in any displayable ASCII character value. For instance, if the parameter is typed in as Blink=42, the cursor will become a blinking asterisk (if you will pardon the phrase!) As funny as it sounds, it is a rather powerful parameter because it means that any character displayable on the screen can be made into a cursor.

Blink,Large
Blink, Large automatically goes to a large blinking cursor — character 143 — and automatically enables the command.

Blink, Small
Blink, Small. The opposite displays character 136.

Drive=d
This command sets certain parameters for the disk drives. The valid parameters for 5" drives are the delay on and off. The delay is the time allowed between drive start up and the first attempted read of the diskette in that drive. OFF sets this delay to ½ second, ON sets it to one second. The latter, of course, is the normal delay time for 5" drives. The DISABLE parameter is a particularly useful one and will effectively remove the drive from the cable. If, for instance, drive 1 is disabled, then any attempt to access it will result in an error message. When you have important disks in place, this can be very useful. The reverse, of course, is to enable. The final parameter is to set the stepping rate of the drive number and it is available for either 8" or 5" drives. Stepping rate for 5" drives may be varied between 6 and 40 ms, for 8" drives between 3 and 30 ms.

Drive=d, Driver
This is the command that is used to configure the System when the hardware enables the 8" and hard disk usage. The Lobo expansion interface and others allow such usage and this program will notify the System what capacity is available on each drive.

JKL, Graphic
The JKL part of this function will be familiar to Newdos users. When enabled, pressing the J, K and the L keys together will send the contents of the screen automatically to the line printer. The graphic part informs LDOS that your line printer has the capability to reproduce the TRS-80 graphics characters during the screen print. If this parameter is selected, any graphic characters on the screen will be sent to the line printer during a JKL command.

Lower
Enables the lower case driver.

Type
This is similar to the type-ahead function in the TRS-80 Model II, but in that machine type-ahead cannot be switched off. With LDOS it may enabled or disabled. The purpose of type-ahead is that when enabled all keyboard entries are accepted

Copy
Although an existing command there are a large number of enhancements. One of the most important is that it is not necessary to create a mirror copy of the file which is being copied. Logical record lengths may be changed as may be the directory entries. The parameter CLONE may be used to create an exact duplicate of the directory entry of the original file. In addition, COPY may be used from device and from device to file spec. If CLONE is not called, then COPY will allocate the current data to the copy. This feature is important in that the date upon which the last operation was carried out on a file is always available to the user. Hence one is never in doubt as to the last occasion upon which a file was updated. Copying from device to device is really self-explanatory. The command such as COPY *KI TO *PR for instance will cause the computer to direct all keyboard input to the printer. File spec to device or device to file spec also is self-explanatory. COPY *KI TO KEYIN/NOW:0 will send all keyboard entries to the disk where they would be stored in a file called KEYIN/NOW. In the reverse, COPY ASCII/TXT:0 TO *PR would copy the contents of the file ASCII/TXT to the line printer.

Create
Like the BUILD and DO commands, CREATE is very similar to the command of the same name in the Model II TRSDOS and allows the creation of a file of a type and size stipulated by the user. The three parameters allowed are to set the logical record length, to set the number of records to be allocated to the file and, finally, the amount of space in 1K blocks that the file is able to hold. There are a number of advantages in pre-creating a file. Probably the most important is that the resulting files will be as compact as possible on the disks. In other words, will have as few extents as possible. The result of this is that the drive head is not nipping all over the disk when reading and hence a faster read and write is obtained.

Date
Existing command. On power up the user is asked to enter the date in the format of MM/DD/YY. This is then converted to the full date which is displayed on the screen. Hence 04/04/81 will result in the slogan ''SAT,APR 4, 1981'' and this may, of course, be used in Basic programs or in LDOS. A rather nice feature (as compared to the Model II) is that the date, only has to be entered at power up. Hitting the Reset or using the BOOT command will leave the date untouched. As previously mentioned the date is used by the System when creating files, making backups and formatting disks. If the date is not set (and it may be avoided by simply hitting the Enter key) the update date will not be filed. In other words the ''last - written - to'' date will not be updated.

Debug
Existing command.

Device
This command will display details of all logical devices which are used and the devices and files to which they are currently pointing and/or attached to. It will also ''log'' the diskettes currently in the available disk drive by updating the Device Table to show the number of sides, the density, and the location of the directory track. The data displayed so far as the drives are concerned are the type (5", 8" floppy, hard) the number of tracks, whether or not it is single or double density, single or double sided, the stepping rate of the drive and the delay of the drive. DEVICE is not an operational command, it merely gives you information. It is, however, useful in the sense of checking drives. For instance, should garbage be returned by the command, it will indicate that the Drive Code Table on the disk is incorrect.

DIR
Obviously an existing command, but one that has been considerably enhanced. In addition to the normal A, I, S switches two additional ones are added. One to enable the directory to be printed out automatically and one to permit non-stop display (scrolling) of the directory information. It will be understood that any disk operating system which supports both 5" and 8" floppies together with hard drives, as well as double density and double sided disks must have a comprehensive directory command. The obvious reason is that there are far more files on 8" floppies than there are on a 5" and even more on a hard. The Directory command in LDOS therefore has many options and switches which are available to control the directory output. The manual, for instance, devotes no less than 7 pages to this command. Unlike previous DOSs, the simple command DIR will not just access the disk on drive 0. It is used as a global directory command and each copy of the drive's directory will be displayed. It is obviously beyond this description to go into the command completely. Two probably insignificant points appeal. Firstly, as in the Model II, the free space on the disk is displayed with the directory. Secondly, a ''+'' may appear after some file names. This will indicate that the file name marked has been written to since it was last backed up.

Do
Also see BUILD. The command executes a file created by JCL.

Dump
Existing command. Used, of course, to DUMP a specified block of memory to a disk file. Important enhancements are that the DUMP may be in load module or ASCII format. Also an optional end of text marker may be specified. Thus word processor files such as Scripsit or Pencil may be manipulated.

Filter
This command establishes a filter for a specified input/output path. It is used to set up an input/outut path through a filter routine contained in the specified program. Any data needed by the program may be passed by the optional parameters. A Filter program can provide many useful functions during input/output process. Lines and/or characters can be counted with certain actions taking place when preset limits are reached. Character conversions could be performed such as changing each linefeed to a null. Filter programs may be provided by the user but will require knowledge of a Z80 Assembler. A complete description of Filter routines and how they are written is contained in the technical section of the manual where several actual Filter programs are shown and described. Two prewritten Filter routines are provided in LDOS. The first is concerned with the printer and limits, or filters, the output to 80 characters per line. Any sinlge line which is greater than 80 characters in length will wraparound and will be indented six spaces on the next line. The other prewritten Filter program is concerned with the use of the Key Stroke Multiply feature.

Free
Existing command. Because of the number of different disk drives that can be used with LDOS, the maximum capacity of the disk is shown in addition to the free space. Also the maximum number of files available is shown in addition to the number of free files available.

Kill
Existing command.

Lib
Existing command.

Link
This command is used to link together two original devices. They may be unlinked with the Reset command.

List
Although an existing command, it has been considerably enhanced and the parameters available are: to set line numbering mode for ASCII text; to set hexadecimal output format; to set type expansion for ASCII text; to direct the output to the line printer; to choose a line in a text file where ASCII LIST is to begin; to set a record number in a file where HEX LIST is to begin; to set a logical record length to be used to display a file when in the HEX mode.

Load
Existing command.

Memory
This DOS command allows you to reserve a portion of memory, see the current High Memory allocation, modify a memory address or, finally, to jump a specified memory location. Thus, merely typing MEMORY will display the current High Memory address, whereas typing MEMORY (HIGH=X'E000') would set the High Memory location to hexadecimal location to E000. Typing MEMORY (ADD=X'4049') will display the contents of memory at address 4049. The display format of this example would be to give the user four items of information, the first being the address specified in hex, the second the decimal equivalent thereof, the third is the contents of the address and, finally, the current High Memory address is given.

be well aware of the maxim that there is no point in re-inventing the wheel and programs which are well written and bug free and which have been issued previously are not included in LDOS. The space made free thereby is used for new utilities and features. Generally speaking, however, it is true to say that LDOS contains almost all of the features of previous DOSs. The only exception that we personally would have liked to have seen in LDOS is a similar directory check to that in Newdos. A particularly nice feature, bearing in mind that one can only get a certain amount on one disk, is the fact that the enhanced Basic — called LBASIC — is made by the user himself. Two files come on the disk called LBASICP1/FIX and LBASICP2/FIX. All the user has to do is to take his copy of the Microsoft Basic on TRSDOS and run the command PATCH LBASIC/CMD .BASIC:0 USING LBASICP1/FIX:0 and then run the same command, but with LBASICP2 and he has an enhanced Basic. Considerable space is thereby freed on the disk for other uses. As is pointed out in the manual, this procedure also saves the end user quite a bit of money as royalties do not have to be paid to Microsoft, so the end user is not paying for something again, which he already has.

Very broadly speaking, LDOS may be split up into the following sections: Library commands, Utilities, Device Drivers, Filters, Job Control Language and LBASIC. We will deal with these separately shortly, but first there are one or two further general points that should be made.

LDOS supports upper and lower case and indeed includes its own driver. It is not, therefore, necessary to load your own drivers. An important point is that the system supports both the Tandy lower case modification and the Electric Pencil one. The user may choose whether to display unshifted or shifted upper case and vice versa. LDOS is, of course, compatible with Scripsit and Electric Pencil.

Keys may be assigned special commands, functions or characters with the Key Stroke Multiply feature. Unlike many shorthand programs, LDOS does not use the Shift and an alpha key, but the Clear and an alpha key. Due to this it is necessary to press the Shift and Clear key to clear the screen.

The Shift and Break key will reselect a 5" disk drive that has timed out and hung up the system. As we all know, this occurs when a drive door is left open or no diskette is in the system. This is quite an important feature because it is thereby no longer necessary to reset the entire system when such a catastrophe occurs.

The disk drive can be 5", 8" or hard disk and LDOS will support double or single sides and double or single density. The maximum track count on floppy disks is 80. Obviously hardware modifications will be required before some of these features can be used. The expansion interface can be the regular Radio Shack interface, the Lobo LX80 or the Video Genie expansion box. It is appropriate to mention here that so far as we know at the time of going to press, LDOS is completely compatible with the current Video Genie. Obviously with such a complex system we have not been able to go through every single command on the Video Genie. Should any user come up with incompatibilities, we would like to hear of it so that we can advise Lobo International. The RS-232 ports are supported by LDOS (although again we have not had time to try the Video Genie one) and LDOS also supports the Percom Doubler.

LDOS is what is called Device Independent. Users who are not familiar with VTOS (in which Device Independence was a major feature) will have to take it from us at this stage that this is an extremely useful and efficient function, as it is beyond the scope of this description to go into the full details of it. Briefly what it means is that your system device, such as the video display, printer, disk drives and keyboard can be routed or linked to each other in almost any way that you desire. It is even possible to create your own logical device. To give a very simple example, after a certain command is entered the input from the keyboard will be routed to the printer instead of to the VDU. Its route can even be to disk files so it is possible to type into a file!

The Boot system can be controlled by the user with the JCL features, which will be described later, and also with the single key strokes. For instance, powering up or resetting with the Break key depressed will cause the machine to go directly into Level II Basic. The Clear key will prevent any configuration file from being loaded. This configuration would be created and stored by SYSGEN, a Library command, again to be described later.

The System has an inbuilt key repeat feature, that is to say holding the key down for about ½ second will cause that key to be repeated. Key debounce, of course, is also included. Both of these features may be disabled by pressing the up arrow on power up or reset.

LDOS includes the normal disk DEBUG utility. This is called simply by pressing the D key on Reset or power up.

As it is such an important feature, a brief mention should be made here of JCL, the Job Control Language. This is, in some respects, similar to the one in VTOS. Its principal function is that through the use of the DO Library command it is possible to create a sequence of commands and functions, store them in a disk file and recall and execute them at any time. JCL will allow for inputs, variables and conditionals. It even has a screen flash and audio tone alert modes. Probably the most important feature of JCL is to make the user's life a little easier in his day to day operation of the system. It is extremely versatile but somewhat complex. The authors of the manual quite rightly recommend that the user spends some time on understanding this section of LDOS so as to get the most from it.

LDOS is guaranteed by Lobo to be upward compatible with TRSDOS, that is to say LDOS will be able to copy all files and programs from existing TRSDOS disks on to LDOS formatted disks. The latter should be the only ones used in the day to day application of the System. The system is not, however, downward compatible, hence LDOS formatted disks should not be used with TRSDOS. To use files created on other operating systems, it is only necessary to move them on to LDOS formatted disks. There are some 4 or 5 commands in the System which makes this transfer an easily accomplished task. The manual states that disks created under Newdos are not guaranteed to be compatible with LDOS. We have been using the System for 4 or 5 weeks now and have not been able to trace any incompatibility to Newdos. In that LDOS is in competition with Newdos + and to a greater extent Newdos 80, it is not surprising to see such a statement in the LDOS manual and although obviously we cannot reverse the guarantee of Lobo, we think it should be taken with a large helping of salt. Whilst speaking of competition, the two principal functions of Newdos 80, of course, were the ability to use various capacity drives on the same cable and the ability to create and use variable length records rather than the standard 256. Both of these features are available in LDOS and the format has been greatly enhanced.

Unlike some of the earlier DOSs LDOS at all times respect High Memory and its value may be viewed at any time with a Library command. LDOS always protects its own routines by moving High Memory lower in memory.

LIBRARY COMMANDS

When describing these Library commands, only important changes in commands, which exist in other Systems, will be mentioned. It should be borne in mind, however, that the majority of the LDOS Library commands contain enhancements to these existing commands. Thus the expression "existing command" will always mean that all of the functions in an existing command are available in LDOS but, additionally usually some enhancements will also be present.

Append

In addition to the normal function of appending one file to another, with this command a device may be appended to a file spec. Thus, for instance, characters inputted from the keyboard may be appended directly to a file on a drive.

Attrib

Existing command.

Auto

Existing command. It may be defeated on power up with the Enter key.

Boot

This command causes the disk in drive 0 to be booted into the System. It has the same effect as the reset push button switch on the back of the keyboard or a power up position. All devices will be returned to their normal power up configuration as if the System has been turned off and then turned on again. The single key stroke commands mentioned in the introduction above are applicable. Thus typing BOOT up arrow will disable the keyboard debounce and repeat functions.

Build

This command allows the user to build a file of desired commands and save this file under any valid file spec. BUILD is available mainly to build ASCII files for use with the DO, KSM and PATCH features of LDOS, although it is possible to build files containing any characters from 00H to FFH with the HEX option. To put it more simply, the BUILD command will create a file which may be called by the DO command on power up. The contents of the DO file will thereupon be carried out. The HEX parameters mentioned allows the user to enter characters other than those directly available from the keyboard and as mentioned, any one byte value may be entered. This command together with the DO command is extremely powerful and is essentially an enhancement of the commands of the same name contained in the TRS-80 Model II.

Clock

Existing command.

different sorts of variables but with strings VARPTR(A$) gives you the address at which the length of the string is stored and the next two point to where the string is kept — hence the "+1" and "+2" in line 80 below. We are going to use the USR call to get at the m/c. In the TRS-80 and the Genie the start of a USR subroutine, or rather the start address, is stored at 16526 and 16527. Hence, all we have to do is to poke the start address into these addresses by referencing the VARPTR command:

```
80 POKE 16526,PEEK(VARPTR(A$)+1):POKE 16527,PEEK(VARPTR(A$)+2)    100 X=USR(0)
90 INPUT"PRESS ENTER WHEN READY TO GO";Z                          110 GOTO 110
```

Line 100 calls the m/c and 110 keeps all those lovely asterisks on the screen. And that's all there is to it. To try it, type in lines 10 to 110 (CSAVE before running if you want) then RUN. To fill your screen with other characters, CLOAD and change the 42 in line 70 to whatever you want. To go round again BREAK and GOTO or RUN 90. Let's go a bit further as I have a bit more space to illustrate an entirely different matter. Try RUN after having got the screen full and BREAKing. Errors referenced to 4394 ? List — there is no line 4394. Obviously the machine is bust — but no! WE've always been told that you cannot harm the hardware from the keyboard, so there must be a logical explanation. Basic lines are held in memory in the format: 00 — line separator; nn nn pointer to start of next line; nn nn line number and then the line content. Consider the hex we packed — 21 00 3C 36 2A 11 and so on. The poor thing took 00 as the start of a new line, 3C 36 as the next line pointer and 2A 11 as a line number. Most things at a m/c level are stored backwards (explanations at some later date) and 2A 11 was read as 112A which is hex for 4394. There is a moral there actually, however inexplicable a problem seems, there is usually a logical solution. Possibly the hardware has failed — maybe the software has a catastrophic bug in it but both are extremely unlikely. Usually, the machine has gone off on some course of its own because of something that we have done to it, which has caused an apparently totally unconnected error message. A microcomputer (and its software!) is a much maligned animal.

Always feel a bit of an idiot with these simpler tips as you probably know them already but I've only just realised that the . abbreviation can be used as the originating line for a range command. If you have current line (just edited, listed or whatever) 10 then obviously LIST . lists 10 and LIST 10 - 50 will list 10 to 50 but so will LIST . - 50.

Fully supported software

For what is believed to be the first time in software development, Molimerx Ltd. announces their new policy of fully supporting any software published by them. This means that once a program is purchased from us, then you have it for life. Furthermore, this support extends to any part of the globe. If, for instance, your dog chews up your disk or your daughter re-records a program cassette with some rock and roll, we will replace this software free of charge. The only cost for which the customer will be liable will be a charge for the media if this has been destroyed.

Molimerx is also adopting the policy of updating software published by them at a nominal charge. This is, of course, over and above the normal corrections of any bugs that appear in the programs after publication. If one of our authors changes a program so that some features are bettered, then the customer need only send in his original tape or disk and we will update to the new version. Unless otherwise stated in our sales literature, there will be a standard charge for this service, namely £2 plus V.A.T. plus postage and packing. Should we find it necessary to supply new media there will, of course, be an additional charge. The updating service mentioned above will also be relevant if a customer changes his machine, so long as that change is within limits of compatibility. In other words, if a customer has bought a disk for the Tandy Model I machine and then sells that machine and changes to a Model III, we will update to the Model III version at the above mentioned cost. There is one restriction to this offer and that is that the program must be within our control, that is to say, it must be one that has been written by one of our authors or one for which we hold licensing rights. So the programs that do not come within this update service are mostly restricted to programs which we import pre-packaged from, for instance, Microsoft or Tandy. With these programs it will be for the original manufacturer to decide their own update policy.

MAY LISTING

LDOS — THE FIFTH GENERATION DISK OPERATING SYSTEM

It would almost be possible to write a book on the disk operating systems for the Model I TRS-80. It all started with a gentleman called Randy Cook who wrote (and according to him got paid very little) the original 2.0. This was modified by him to the 2.1, but the 2.2 and 2.3 were Tandy patches to the original. In other words, all of the TRSDOSs emanated from Cook. He had various difficulties with Tandy and branched out on his own to write the VTOS 3.0. This was licensed to a company that went out of business. VTOS 4.0, we believe, was marketed by Cook himself, but we understand that for personal reasons he has given this up. Meanwhile, 2.1 was patched by Apparat who also added a number of useful utilities and called it Newdos+. We feel that it was the first timely operational DOS for the Model I. Then came Newdos 80 which, although original, is still based on the TRSDOS's in the sense that it enhanced them rather than struck a new course. In any event, the important point so far as the "History of the DOSs" is concerned is that they have all really emanated from Randy Cook. LDOS is the first entirely new DOS written by third parties. It was written by no less than 8 first rank programmers, most of whose names would be familiar to the average TRS-80 user and they range from Lance Micklus of Star Trek fame to Roy Soltoff who wrote Junior Utility and many other excellent programs. Six other programmers were in the project in an advisory capacity. Again, at least two of them are household names. Some of the bug free coding of Cook's has been incorporated and credit is given to him in the manual. The important point is that the LDOS team were able to plan their operating system with all of the previous DOSs in their minds and with full awareness of both the good and the bad parts of them. The result is a disk operating system which we feel should become the industry standard.

One of the serious and valid criticisms of the DOSs has been the poor documentation. We have always thought that the original Tandy book was a good one, but certainly the Tandy documentation for 2.2 and 2.3, Apparat's documentation for Newdos+ and the documentation for the VTOSs are not of a high standard. Newdos 80 documentation is complete, but tends towards the "computerese". This, therefore, was another matter upon which the team could look back on and they have made certain that they have not fallen into the same trap. The documentation that accompanies LDOS is in a binder and the layout is reminiscent of the original Tandy book. Each library command, for instance, starts with a short description of what it does, then gives the syntax and parameters and, finally, comments are made on its application and use together with examples if necessary. The language is understandable and it avoids computerese as much as possible. Parenthetically, one word usage that we cannot understand is that a track is called a "cylinder". The mind boggles at the logic of this!

The team were sensible in planning LDOS and obviously a very great deal of thought has gone in to what it should contain. They seem to

companies for adaptation to the TRS-80 Model II and it has taken us some time to assess the various systems and to decide whether or not to accept the license which Digital offered us. In the end we came to the conclusion that although adapting it ourselves would save the customer some money in that the end price would be cheaper, he would not be getting such a good product, as the U.S. suppliers who have licenses have had so much more experience than we have with the program. It then became a matter of choosing which one to stock and we have elected to stock the CP/M2, which is an adaptation by Pickles and Trout of the original Digital Research program. In addition to the adaptation they have also added a number of utilities. CP/M is, of course, a disk operating system and takes the place (in the case of the TRS-80 Model II) of TRSDOS. Disk operating systems, for some unknown reason, are a matter of taste and seem to be subject to fashionable trends. The big advantage that is claimed for CP/M is that there is more software written for it than for other systems. This is probably undeniably true, but the majority of it is American written software and although, as we have said before, it is a matter of taste we have never really felt the need for anything more than TRSDOS. However, if customers wish to put CP/M on to their Model II, then we can highly recommend this one.
There are three Pickles and Trout versions of the CP/M available for the Model II. The first and standard version is for the single-sided floppy disk normally found in the Model II, the second is for a double-sided floppy disk and the third for hard disks fitted with the Cameo hard disk controller. At this time we are only stocking the standard version, but we can, of course, obtain any of the others to order. CP/M2 is extensively documented. It comes with a set of the original seven Digital Research CP/M manuals, plus a special manual dedicated to the Model II version. Obviously, therefore, it is impossible to describe the system fully, but we will endeavour to go through some of the advantages of CP/M2.

Under CP/M2 the disk capacity of the Model II is increased by approximately 100,000 bytes. Under TRSDOS 509,184 bytes are contained on a diskette, but on CP/M2 this is increased to 610,304 bytes on a single-sided, double density diskette, in other words a standard Model II diskette. The double-sided version increases this to 1.2 megabytes and the hard disk version contains 10 megabytes. CP/M2 automatically detects the density of a diskette and treats it accordingly. Hence, mixed density systems can be run. In order to support the maximum variety of expansion drives, CP/M2 allows you to specify the drive head step rate independently for each drive on the system. Available step rates are 3, 6, 10 and 15 ms. Multiple drive software can be run with a single drive system under CP/M2 as it will automatically enter a mode of operation which allows it to simulate a four drive system. This is of particular importance when either running multiple drive software on a single drive or writing on a single drive for multiple systems. Disk access speed is increased with CP/M2. As a comparison, Basic which is about 16K takes five seconds or so to load under TRSDOS. Under CP/M2 an 18K program loads in about 2½ seconds. The serial ports of the Model II become more useful under CP/M2 as they are tied into the normal CP/M input/output structure and may be accessed directly by programs that have special input/output requirements. The serial port drivers support three common types of handshaking to permit them to work with a wide variety of peripheral devices. ETX/ACK and XON/XOFF handshaking, used by many printers, are fully supported. Furthermore, for other devices you can set up the driver to monitor the RS-232 status lines Clear-To-Send and Data-Carrier-Detect to determine when data can be sent and received. A special utility routine is supplied with CP/M2 which displays the current status of the serial ports and allows the various parameters to be changed at will. Nine baud rates are available. 1, 1½ or 2 bits may be programmed and 5, 6, 7 and 8 bit word lengths are available. Parity may be set to even or odd or turned off. The RS-232 status line outputs RTS and DTR may be set to either high or low.

CP/M2 has a very advanced screen driver built in permitting a higher console interaction than is available with TRSDOS. Approximately 20 screen functions are available, including split screen mode and, of course, reverse video and graphics. CP/M2 has a 64 character type ahead buffer for keyboard input. This feature permits the user to continue typing while the computer is busy with other operations, for instance, disk input/output. It also allows several commands to the computer to be ''stacked'' for sequential execution. The console input driver, incidentally, includes a Break filter which enables the programs to disable the Break key on the keyboard when they don't want to be interrupted. The input/output driver for the Centronics port provides three options that allow it to work with most printers. It can be set up to take care of the double spacing that occurs when a printer with auto line feed is used with CP/M. Also available is form feed emulation for printers that do not have form feed capability and the driver can be set up to insert form feeds for automatic pagination. All of these options can be turned off for printers that can do it all themselves. A special set of System functions is provided to allow high level language programs perform tasks such as input/output set up, setting and reading the clock, and direct input/output without writing any machine language routine.

Pickles and Trout have added approximately fourteen of their own utility programs to the original CP/M utilities, to make the CP/M2 a very attractive package indeed. Due to the large amount of documentation which accompanies this software, shipments will normally be by Parcel Post unless other arrangements are made.

Hints and Tips February 1981

In the December column, by popular request as they say, I described how it was possible to pack a string with graphics characters, by changing the program at memory level. This month we will use the same technique to load in some machine code. Normally of course, this is done by either loading a machine language tape under the SYSTEM command or by storing the code in data lines, reading it and POKEing into high memory. The disadvantage of these methods is that Memory Size (Ready? on the Genie) must be answered with an address which will protect the machine code. Sometimes this is not convenient, especially when the code is very short. If a string is packed, this is not necessary, as the machine code is, essentially, part of the Basic program. As usual we will take a very simple example and we will call the code from the Basic program using the USR call. But first we need some code. One of the most useful instructions which the Z-80 CPU has is LDIR, which merely moves a block of memory. As the screen of the VDU is memory mapped — which just means that each screen position has a specific memory address — and we wish to demonstrate something, it is convenient to use LDIR to stuff the screen full with a character. We will use the asterisk, although anything else would do equally well. I won't go into the actual coding as there are plenty of books on the subject. Take it from me that:

```
LD      HL,3C00H        LD      BC,03FFH
LD      (HL),2AH        LDIR
LD      DE,3C01H
```

will do the trick. It's not hard anyway. 3C00 in hexadecimal (H) is the start of the video memory, 2A is hex for 42 decimal which is the ASCII code for an asterisk, 3C01 is the next screen address and 3FF is the number of times we want to transfer the block. Actually, the ''block'' is only one byte in this case so what we are doing is putting the asterisk into 3C00, then transferring it to 3C01 and up 1023 times. With the first placement, this will fill the 1024 screen positions. There is one more chore. We know that this is going to be a m/c subroutine to be called from Basic, so we will need to come back to Basic. We just add a RET (return) command. The hex for the above is 21 00 3C 36 2A 11 01 3C 01 FF 03 ED BO and for RET is C9. In the December example we got the string packed with the same byte, a graphic character. If we just substitute the hex code above for the character we will have achieved our object:

```
10 A$ = ''ZZZZZZZZZZZZZZ''
20 PRINT A$
30 FOR C = 17129 to 17150
40 IF PEEK(C) = 90 THEN READ D:POKE C,D
50 NEXT                                  For Level II only
60 PRINT A$
70 DATA 33,0,60,54,42,17,1,60,1,255,3,237,176,201
```

The first four and a half lines are much the same as last month's. The second half of 40 merely substitutes the DATA items for 191, the graphics block. Lines 50 and 60 are the same. The DATA is just the decimal for the hex mentioned above. All being well we have packed the string with the m/c. Try it, the first PRINT A$ will show the Zs still there and the second will show how the string has changed. You might want to CSAVE before running, so that you don't have to type it all in again. Don't CSAVE after running or you will be in a mess. Also let me pause there to emphasise that all of this is just to explain the technique. We will see in a minute that it works, but all of this data reading and poking is simply illustrative. In practice the string is packed with a Monitor or with a specially written program. Anyway to continue. We have packed the string with m/c but how do we get at it? Luckily Microsoft put in their Basic a command which we can use, namely VARPTR. All this does is to tell you whereabouts in memory a variable is stored. Its use is a bit different for

Disk Purge

1. Kill Selected Files
2. Kill by Category
3. Remove System Files
4. Remove all Passwords
5. Disk Directory
6. Zero Unused Entries
7. Zero Unused Granules
8. Change Disk Name
9. Change File Parameters
10. Check Directory

Disk Format

1. Standard Format
2. Special Format
3. Format without Erase
4. Build Format Track
5. Write Format Track
6. Software Bulk Erase

Disk Backup

1. Standard Disk Backup
2. Backup non standard disks

These two commands require some explanation, or rather the second one does, for the first just carries out a disk backup of any standard disk. It has one or two features over and above the normal Backup or Copy commands, but essentially this is what it does. The second command, however, is of great importance, for the authors claim that with it, any disk, whether protected or not can be copied. As a matter of fact this is not true. We have come across some programs that cannot be copied with SU + , but it is fair to say that they are few and far between. Essentially what the utility does is to make the first pass through the disk reading the track and format layout and making a note of whether the format is standard IBM or not. It then copies the data and formats a blank disk as a mirror copy of the original. The data is then copied on. Normally with non standard or protected disks this will work, but as we have said, sometimes it does not. It is essentialy a matter of trying it and seeing.

Disk Repair

1. Repair Gat Sector
2. Repair Hit Sector
3. Repair Boot Sector
4. Read Protect Directory
5. Un-read Protect Directory
6. Recover Killed Files
7. Move Directory
8. Display Directory
9. Check Directory
10. Clear Unused Entries

Tape Utilities

1. Read Tape
2. Write Tape
3. Verify Tape
4. Copy Tape

These are strange utilities to find in a disk program, but they are, as a matter of fact, extremely useful. There are the normal Read, Write and Verify sections, but the copy tape can be very useful. In order to use it you must have two recorders and what it does is to take the signal in from one, polish up the pulse wave forms a little and send it down to the other. Unfortunately it is not possible for a checksum to be carried out at the same time. Accordingly one really needs a pretty strong specimen of the program in order to copy it.

Memory Utilities

1. Display Memory
2. Move Memory
3. Exchange Memory
4. Compare Memory
5. Fill Memory
6. Reverse Memory
7. Test Memory
8. Jump to Memory
9. String Search
10. Input Byte from Port
11. Output Byte to Port
12. Memory to Sectors
13. Sectors to Memory
14. Memory to Track
15. Track to Memory

File Utilities

1. Display File Sectors
2. Compare Files
3. Copy Files
4. Disk Directory
5. Free Space
6. Offset a File
7. File Locations
8. Drive Status
9. Sector Allocation
10. Build a File
11. Clear a File
12. Disk Allocations
13. Compute Hash Code
14. Compute Passwords

The first item is an easy way to inspect files on the disk. The second is a comparison feature which is useful in that files are compared byte by byte and any mis-match is pointed out. The Copy Files routine is handy so that one can carry out this chore whilst still within SU + . The Disk Directory feature gives not only the name of all files regardless of their status, it also gives the number of tracks on the disk, the number of free granules and free files. It is certainly a lot easier than going to the appropriate track and reading it all off the directory entries. The Free Space is similar to the same utility in TRSDOS and other DOS's. The File Offset is similar in some ways to LMOFFSET in NEWDOS. It allows you to load a file into memory at the location of your choice or load a file into memory at one location and then have it moved to another location and executed. You may even disable the interrupts. One of the features of this group that we use the most is the File Location which gives you complete information about the location of files on a disk. Drive Status is self-explanatory and the Sector Allocation is really the reverse of File Allocation. It gives you the name of the file present on a given Drive, track and sector number. Building a File enables the user to pre-allocate space on the disk, the big advantage of which is that the file is far more contiguous than if it had been written normally. Clearing a File not only clears it, but erases it, so should only be used with the utmost caution. Disk Allocation is rather complex to begin with, but one gets used to it. Graphic representation is given of the entire disk and its granule allocations. The last two features are again self-explanatory. Compute Hash Codes is moderately common now. We never seem to have any luck here with password decoding programs, sometimes the decoded password works and sometimes it does not. We have tried this utility on one and it worked, but we are not at all sure that we would want to guarantee it for all passwords.

NEW VIDEO GENIE

Current models of the Video Genie have the Righthand Arrow and Clear keys fitted to them. Present owners of the machine can have the keys retrofitted at a very low charge, either through their local dealer or through Lowe Electronics. As this has been the chief incompatibility between the Genie and the TRS-80, as from March 1st 1981, all Video Genie orders will be treated as if they were for the TRS-80, in other words the TRS-80 version of a program will be shipped from that date, regardless of the machine on which it is going to be used.

Customers may still, of course, purchase the modified Video Genie versions by stipulating this requirement in their order. We emphasise, however, that if this is not stated, the TRS-80 version will be shipped.

The reason for the above is that the use of the arrow keys particularly is normally more logical and easy to use than the Genie modified version.

CP/M — AN ENHANCED VERSION FOR THE MODEL II

The CP/M is a disk operating system written by Digital Research in the United States. We have been rather late in coming to market with CP/M, mainly because of its somewhat unique history. Digital only supply it for one particular main frame machine. However, they do grant licenses so that the original CP/M can be adapted for other computers. They have granted licenses to three or four

PROBE — PERSONALITY EXPLORATION BY COLOUR CHOICE

A number of eminent men for some long time maintained that as it is our personality that decrees our taste in various matters, so that taste must reflect a person's personality. Indeed, we think we are right in saying that this very general theory is widely used in a number of applications in psychiatry. One of our tastes is that of colour. Some people prefer one colour, some people prefer another. Probe is a program which ''forecasts'' the personality of the user of the computer on the basis of his choice of colours.It comes complete with eight colour swatches. The user chooses the colours which he likes and answers the computer accordingly. The personality is then cast. This is the general theory of the program. In actual use the operator must examine the colours without spending too long on it and without associating the colours with anything else, for example the colour of the furnishings in the room or clothing. The operator must simply choose the colour fairly quickly which appeals to him most. The author of the program recommends the colours be placed in a pile in their preferred order and then the operator should repeat the selection after about five minute in order to give the subconscious time to respond to the colours of the first choice. The purpose being to give greater validity to the second choice. On trying the program out, we have skipped this stage and we must say that we have attained some rather surprising results, in that the printout and personality on the screen does seem to fit that of the operator. The program outputs quite a large quantity of information. The first is concerned with the amount of conflict present in the personality of the user. First he is given, in the form of a percentage, information as to how his choice compares with the national average. This is followed by information as to the amount of conflict within the personality of the user. Eight areas are examined for conflict. Next an anxiety rating is forecast on a scale from 0-12, representing calm to anxious. In other words, the higher the number, the more anxiety there is present in the personality. Finally, a colour decode is carried out. The computer, in fact, accesses about 50K bytes of data to compile the colour decode. It lists the user's desires or behaviour as dictated by those desires, the existing situation and its influence on the user, characteristics under restraint, details of the characteristics that are being suppressed within a personality and are therefore causing anxiety and, finally, any areas which are causing stress. The program is extremely easy to use and as we have said, on the occasions that we have used it, the results do seem to bear some relationship to the personality of the user, but as with all programs of this type, we must make the general disclaimer that we cannot guarantee the results! Due to the large amount of data which is accessed by the program, the program is disk orientated and is not available for tape.

''THE EASY WAY TO PROGRAMMING IN BASIC USING THE VIDEO GENIE SYSTEM''

This is a book by John and Judy Dean, written in Australia where the Video Genie system was introduced rather earlier than in Europe, but published by Lowe Electronics, the Video Genie importers in U.K. Having recited above the rather long title of the book, there is not an awful lot left to say about it. The authors take the reader through most, if not all, of the Basic commands and statement and all of the explanations thereof are given in relation to the Genie. It is, therefore, very attractive to the Genie user, who no doubt is getting rather fed up with having everything explained to him in the terms of TRS-80 key names. Probably one of the other attractive features is that in the process of explaining how to program in Basic, the reader is also introduced to the general usage of his machine. We are not sure, however, how much additional information the book gives over that given in the manual. The book is written competently in what we like to call a ''folksy'' manner, in some ways similar to the Level I TRS-80 Manual. The book consists of about 100 pages of A5 size. The only real criticism that we have of the book is that it is very elementary. We would not recommend it to anybody except a beginner. In fact this is not really a criticism because the cover of the book itself says ''ideal for beginners'', so within that context it should be a worthwhile purchase for Video Genie owners.

ADVENTURE TIPS

The whole purpose of the Adventure series is that the user should make his own way through the Adventure without assistance. However, some customers can get bogged down, the result being that he becomes frustrated. Scott Adams, therefore, has prepared some Tip Sheets, one for each Adventure, which do exactly that, namely supply tips for the user to pursue should be find himself in a situation from which he does not think he can extricate himself. We would like to emphasise that these sheets contain tips or hints only. We mention this because the sheets available for the Microsoft Adventures are very full. These by Scott Adams are not intended to be a fullproof guide through any particular Adventure, they are merely intended to give a helping hand. These sheets are available from us at 50p per Adventure.

GENERAL

As a matter of policy with regard to all of our programs, we always ship the current and most up-to-date version to customers, so there may be some small discrepancies between previous descriptions in the catalogue and the actual program received. Obviously the updates are always improvements so the customer is gaining from this apparent anomaly.

SUPER UTILITY PLUS — A COMPLETE DISK ACCESS PROGRAM

As its name implies, the purpose of Super Utility Plus (SU4) is to provide the user with almost every conceivable feature that he could possibly need with regard to accessing disks and disk drives, within the one program. Before we describe it, there is one thing that should be mentioned. The author is Kim Watt of the United States who is, as customers will probably know, a well known programmer, particularly specialising in disk operating systems. When he wrote SU + he did so with the intention of making it uncopyable. Nothing created by man cannont be undone by man, so it is in fact not uncopyable, but to the majority of customers it will be. This seemed to us to be unfair, as we have always maintained that a user should be able to at least make a backup of any program which he buys. We therefore made arrangements with Mr. Watt that every copy of SU + that we sell will, in fact, contain two disks, the one the backup of the other. Hence if one becomes corrupted it can be returned to us for replacement (which incidentally, has to be done from the United States) and the backup can be used. The disk comes with a Registration Card and we most strongly recommend that the purchasers fill out this card and send it back to Breeze Computing (Mr. Watt's Company). If this is not done, the repair facility will not be available to the owner and furthermore he will not receive notices of updates. With a program such as this, the latter is most important.
SU + may be configured to read single or double density disks and tracks of any number up to 80 with any standard stepping rate. The directory may be on any track, any standard delay may be used, and high or low speed clocks are acceptable. In other words, within all reasonable limits, SU + is usable with pretty well any disk configuration or DOS. There are eight main sections to SU + and a list of these with their individual commands follows:-

Disk Zap

1.Display Sectors
2.Versify Sectors
3.Compare Sectors
4.Copy Sectors
5.Copy Sector Data
6.Zero Sectors
7.Reverse Sector Data
8.Exchange Sectors
9.String Search
10.Sector Search
11.Read ID Address Marks
12.Alter Data Address Marks

One of the more interesting features of the Zap section is the ability to reverse sector date. the mind boggles at the purpose of having the data that was at 00 now at FF and so on throughout the whole sector, but no doubt somebody will come up with a good use for it. The author suggests that it has definite possibilities in the area of disk protection. The ability to read ID address marks has been added as has the ability to change them. Although sectors could be exchanged with SU, it has now been made a lot easier with SU + .

feed it into memory and then make a source tape with Misosys, which can be fed into the Editor/Assembler for further processing. Misosys is for tape and disk systems. It uses the Clear key to revert back to the Menu after a disassembly so to that extent it is not compatible with Video Genies which do not have the Clear key fitted.

BANDITO — A NEW SLOT MACHINE GAME

There are a number of slot machine games available. We already stock one, but this is a new one from Acorn Software which features not only extensive graphics, but sound. It is compatible with the Video Genie as well as the TRS-80 and also for Disk Basic on either machine. The playing of "one armed bandits" is well known so there is not very much to say about the program. The graphics are good and include an actuating arm which is pulled down. The sound is realistic for the drums going round and a rather nice touch is that when, and if, you win, the "mouth" of the machine showers out large sized dollar signs to the accompaniment of a rather satisfying clink of coins! Frankly, we find slot machines rather boring, but if you like them then this is a good version for you.

CREOLE LOBSTERCATCHER — A NEW STRATEGY GAME

The theme of this interesting new program is that the player is a fisherman in the Caribbean and when he commmences play he owns one boat, six lobster pots and no cash. He may fish inshore or offshore and in the case of the former, he can earn £2 per pot per day and in the case of the latter, £6 per pot per day. The hazards of fishing offshore, of course, are far greater than those of fishing inshore. For instance, when fishing offshore he can meet high currents, in which case his offshore pots will probably be lost. If he encounters a storm, then all offshore pots and boats are lost. However with many storms a day's warning is given of its forthcoming occurrence. Bad weather can be experienced offshore, in which case there will be no offshore catch, but inshore prices double. Occasionally, the tourist season will come round and catch prices will double. We are not quite sure what this one means, but occasionally a Lobster Convention will take place, an announcement will be given one day before and offshore prices treble. Carnival Days will be declared occasionally, whereupon the tourist season will come about and there is a one in five chance that half of your crews will run off with your boats. As you might expect, various other surprising events take place on Carnival Day. Pay day takes place on the last day of every week and is accounted as £80 per week on a daily basis. If there is insufficient cash to pay them, the crews will run off with the boats. Play is on a daily basis. Altogether, this is an interesting program which should supply amusement for all.

NUMB — RECOVER PROGRAMS AS WELL AS RENUMBER

This program is a utility for renumbering, merging and recovering programs. The renumber section of the program is reasonably luxurious in that it is not just a straight renumber. It is possible to renumber a selected portion of the program and warning is given of any unreferenced lines in that program. The merge feature is the normal one whereby one can block off a resident Basic program, load or type in another one, load and then rejoin. This can be done as many times as is required. The recover section of the program is intended to be used when a resident program is inadvertently lost by, for instance, typing NEW by mistake, or unintentional reboot. Obviously, in order for this feature to work, the vectors and other Basic data addresses must have been left untouched. The program may be put on to disk, but as both TRSDOS and NEWDOS have renumbering features built into them, disk users will obviously find the program rather unattractive. NUMB is compatible with the Video Genie.

TING-TONG — MACHINE LANGUAGE AND SOUND

This is the well known computer game of Ping Pong with the addition of sound and of machine language programming. Actually one wonders whether the latter is really worthwhile because the speed resulting from the highest speed of play selected (there are seven to choose from) is so fast that it is doubtful whether a game could be played, at any rate in the single player option. There are two options for play, either the user plays against the computer or two human players take part. In the latter case, the two missing keys of the Genie are used, hence the program is not compatible with Genies that do not have those keys fitted. The play is straightforward and needs little description. The sound effects are to indicate when the ball hits either paddle or a wall and the sounds are different for both. One nice feature not found on similar games is that a game can be stopped in the middle and a return taken to the start. The game consists of fifteen points, so this feature can be useful, particularly when first starting to play and getting used to the game. As we have said, there are seven speeds. The slow is very slow and the fast is very fast!

VISICALC — AN ELECTRONIC BLACKBOARD

Visicalc is a hard program to explain. In some ways it is very similar to our matrix Manipulator shown on page of the catalogue in that it operates on the basis of manipulating a matrix, which of course is essentially a grid made up of rows and columns. In some ways the Manipulator is better than the Visicalc in that it is a "dedicated" manipulator. On the other hand, Visicalc is easier to use from the point of view of general purpose applications. In order to understand Visicalc, it is best to try and visualise a very large blackboard, or if you wish, a very large sheet of paper. On the blackboard is drawn a grid of 254 squares high by 63 squares wide. Now imagine a tube a couple of inches wide which you put to an eye and through which you look at the blackboard. Only parts of the blackboard will be visible. Visicalc constructs the grid or matrix on the blackboard and the VDU is the view that one sees through the tube. By moving the tube over the blackboard one can see various parts of it and in exactly the same way, by using the cursor controls one can move the VDU over the Visicalc electronic sheet. The usefulness of Visicalc is that in each square one can put various values and define the mathematical relationship between them. Taking a very simple example, if one put the figures ten and twenty in two adjacent positions and defined the function of those positions as addition with the result in another square, then the two first squares would retain ten and twenty and thirty would be inserted in the third one. The formula remains static until such time as one changes it. Hence it is only necessary to change one of the squares to twenty for the third square to automatically change to 40. When one considers that Visicalc can handle quite complex formulas and a large amount of data, it does not take an awful lot of imagination to realise that this is very useful in the manipulation of data, particularly when only a few of the items have to be changed, as such changes will affect the entire block of data. Furthermore, Visicalc can be used for almost any problem that would normally be explored with the calculator, pen and paper.String labels may be used to entitle columns and rows and various other useful functions are provided, such as screen splitting, to make Visicalc into one of the handiest manipulator programs around.

Note to 1982 Catalogue Re-write

Since Visicalc was first issued it has been made available for both the Model II and the Model III Tandy. The original is also, of course, compatible with the Genie Model I and II. Although the old version for the Model I worked on the Model III, a new version has been issued which, it is said, contains many improvements. At the time of going to press with this 1982 revision, details of these improvements are not available.

CODE BREAKER — ANOTHER NAME FOR MASTERMIND

Code Breaker is a logic game with sound effects. It is not necessary to describe this program in great detail because it is essentially a computer adaptation of the well known logic game of Mastermind. The object of the game is to determine with as few moves as possible the colours and positions of four secret code pegs. For each move the colour and position of four pegs is chosen and the response of the computer is with a black, white or pink peg in respect of each position of the player's peg. These three colours have different meanings and from their positioning it is possible to logically deduce the position of the hidden peg. The program features sound effects and a graphic layout of the code pegs. Available on cassette for 16K machines and for the Video Genie.

SUPERSCRIPT — AN UPGRADE FOR TANDY'S SCRIPSIT

Superscript is a series of machine language programs which will, within limits, permanently customise Tandy's Scripsit to a user's own printer requirements. A number of enhancements are also added to the original Scripsit program. One of the big failings of Scripsit on the Model I was that the disk directory was not available. This has now been cured and the disk directory can now be called up from within a Superscript modified Scripsit, listing all files and the number of free granules on the diskette. Files can also be killed. This is important and again was a sad oversight in the original program. Quite often it is necessary to kill unwanted files from within a word processor so as to make room for an ever enlarging text. The principal object of Superscript, however, is to provide drivers so that various printers can be used with Scripsit. There are dedicated drivers and general purpose ones. The dedicated parallel printer drivers are for the following machines: Diablo, NEC5330, Line Printer IV from Tandy or the 737 from Centronics, Tandy Daisy Wheel Printer II and the Epson MX80. Dedicated serial drivers are for the Diablo and the NEC5510. There is a general printer driver both for parallel printers and for serial printers. Furthermore, custom drivers are provided for both parallel and serial. These are casual drives to be used when a customised drivers needs to be designed for printers that can sub-script, bold face etc., but are not covered by any of the other parallel drivers. It is most important for customers to know that the whole subject of drivers for microcomputers and particularly for the Tandy and Genie machines, is a complicated and wide one. It is not possible for any general purpose patching program such as Super-Script to cover every feature of every printer. It should not be taken, therefore, that because there is a custom printer, for instance, for the Epson MX80 that all the features of that most prodigious machine can be accessed. Indeed we have a program available that just patches this one printer alone. If particular features of any particular printer are important to a customer, he should telephone or write to us to ascertain whether or not such features are available under the drivers provided in Superscript. Within these limitations, Super-script is an extremely good patch program that enables a large number of printers to be used with Scripsit which hitherto could not be so used.

BLOCKADE — A SCREEN PLAYED GAME

This is a game for two players, each having the control of a graphic block which may be moved in any direction leaving a trace behind it. The purpose is to compel your opponent to crash either into his line, your line or the surrounding border before you do. This game is far better than many others of the same type that we have seen. Although it does include sound, the principal feature is that it is written in machine language and as the players have the option of nine different speeds, the effect of the machine language coding is really shown when top speeds are chosen. In fact in the higher speed it would need a great deal of skill to be able to control the moving block. An additional advantage of this game is that it can be played in four different ways. These are divided into two groups, one with wrap-around and one without wraparound. The wraparound refers, of course, to the screen. If it is actuated then collisions with the border are ignored and the graphic block merely appears on the other side of the screen. The wraparound, incidentally, is on all four sides of the screen. Whether or not you choose wraparound, you may also choose to use either a solid line or dashed line. If you elect for the latter then you and your opponent can sometimes pass through the trace. All in all quite a competent game and, as with a number of these simpler Acorn games, the price is very reasonable. The game loads into a DOS area so it is not compatible with Disk Basic unless it were relocated. However, it is compatible with the Video Genie.

OPERA THEATRE — COMPUTER OPERA

This program is a straightforward musical program and its only function is to play the music from various operas. The pieces available are as follows:—

1. William Tell Overture
2. Sempre Libera from La Traviatta
3. Musetta's Waltz from La Boheme
4. Queen of the Night Aria
5. La Donna E' Mobile from Rigoletto

Obviously with a program that simply plays music reproduction is important and unfortunately we do not consider ourselves to be music critics. Perhaps we are saved from a final decision because the reproduction will obviously depend very much on the amplifier to which the auxiliary plug is connected. When we tried it out we used just a very small sound box and the reproduction was quite good but not thrilling. We have a feeling that if it were played through a better amplifier or hifidelity amplifier the results could be quite interesting. The program is written in Basic and is compatible with Disk Basic, but it does not, unfortunately seem to be compatible with the regular Video Genie sound board. Some sound comes out, but it is not loud enough to be much use so we would not recommend Video Genie customers to buy this program. Finally, if you are using this program with Disk Basic it is wise to switch off the clock as it distorts the output.

JUNIOR UTILITY — A TWO PASS DISASSEMBLER PLUS

Acorn call this program Misosys Disassembler, but to our minds this is a very misleading title because the program is so much more than a disassembler. For instance we are often asked for a program which will extract from a normal system machine language program its start, end and transfer addresses. This is one of the functions that this program will provide. It is only necessary to load Misosys and then select one of the commands with the normal system tape in the taperecorder and Misosys will display on the VDU the addresses mentioned. It seems to us that this is an important function because the other programs that will fulfill it such as the Monitors cost a lot more and sometimes the customer does not require the additional functions of a fully fledged Monitor. Furthermore, Misosys will load into memory any normal system tape and again display the addresses mentioned above. As Misosys itself provides an exit to Basic it is possible to load the machine language program, return to Basic and then using the SYSTEM command access the program which was loaded. With this second feature, of course, the program is actually loaded into memory so it must not conflict with Misosys itself. The Disassembler portion of the program is firstclass and far better than the regular Disassembler which we stock as shown on page of the catalogue. First of all it is a two pass Disassembler. That is to say it makes one run through the memory area which it is to disassemble and constructs a table used for the generation of symbolic labels. A quick word for those customers not familiar with machine language programming. When the commands in a certain area of memory are going to be used frequently (in other words a subroutine), in the assembly process a label is given to the start of the subroutine. When access is required to the subroutine, the label is called rather than its actual address. The advantage of this, of course is that as the call is to a label rather than an absolute address, the address can be changed from time to time without affecting the label. If, for instance, the author in writing the program suddenly decides that at the beginning he wants to add some more code, if he had used absolute addresses he would have to go through each call to that address in the program and alter the address number. If, however, he used labels then it would not be necessary for him to change any of the addresses because the assembly process will do it for him. Simple disassemblers only make one pass through the program and therefore are unable to reference any of these label addresses. A two pass disassembler, however, goes through the program once and extracts the appropriate addresses and builds a table, which is subsequently used in the second pass so that the final disassembly contains all the label points in the program. We used the words "points" because obviously the Disassembler is unable to know what actual label name was used in the original program. In the disassembly therefore, are incorporated symbolic labels generated for address and sixteen bit numeric references which occur within the disassembly area. References preceding the start address of the program are output as equates (EQU) and these can be optionally suppressed. The disassembly output may, of course, be directed either to the screen or to a line printer and is fairly normal in its format. It consists of the address, the hexadecimal contents, a line number, opcode, operand and, finally, the ASCLL EQUIVALENT OF THE HEXADECIMAL CONTENTS: The Disassembler is easy to use and either page or continuous display can be chosen for the VDU. In addition to the above features, Misosys will create a source cassette tape suitable for inputting into either the Tandy Editor/Assembler or the Microsoft Editor/Assembler Plus. This is, of course, a particularly useful feature when it is intended that a machine language program should be amended or modified. It is only necessary to

such a small amount of time that it is not worth timimg it, then the program deserves to be described as instantaneous. Especially as these times are attained on a standard Level II TRS-80. These results are achieved, obviously, by some very clever machine language coding. This however is not enough. After all GSF from Racet will sort 1,000 arrays in about 11 seconds and that is indeed a clever program. No, in order to achieve the results required from this program it is necessary to change one's entire overview of database. There are many databases available for the TRS-80 now. All of them have been designed to store as much data as possible, as easily as possible. Not as an afterthought, but nor as a prime design requirement, they have also incorporated as fast a sort as was practicable. This program was designed from the outset to achieve unbelievably fast sort and search times. Indeed we do not recommend this database for application in which fast sorting or searching is not a prime requirement. And what are the applications? It's a hackneyed phrase to say that they are limited only by the user's imagination, but that's about it. Let's take an example. Suppose you are running a marriage or data bureau. An ordinary database will file all the names and addresses away together with the necessary information as to sex, age and so on and with some you would be able to sort the list, so that only only people with similar characteristics were eventually obtained. With this database you could, for instance, file the name, sex, age, category of hobby, category of chief interest, vital statistics and other data so that at the touch of a button you could instantaneously display on the screen all women of a certain age with certain vital statistics, living in a certain area. You could also display men with similar (excluding the vital statistics!) data that fall into similar categories. And all of this almost instantaneously. Not everybody runs a marriage bureau, but other applications are not hard to think of. Estate agents can file details of property away so that they can instantaneously obtain data on houses in a certain area or of a certain size. Doctors can reach information as to patients with similar diseases, ages or whatever immediately. In the home, a record library can be stored and every record by a certain composer written in a certain year can be accessed without delay. The list of applications is endless. For any use where it is important to extract information within a certain range or it is important to sort information, this database will find a use. The prime commands and features of this program are as follows:

Datafile creation

1. Create a file
2. Add a record
3. Delete a record
4. Display a record
5. Tape a file
6. Amend a record
7. Display the file data
8. Load a tape

Sort/Search

1. Sort up or down
2. Page forward or backward
3. Select a range for search
4. Select or exclude a category
5. Select or exclude on initial letter
6. Resort records in a sort
7. Sort all new records
8. Extended sort
9. Arithmetic
10. Display file data
11. Load a tape
12. Printout sorted data

The data is displayed in columnar form and the data may be alphabetical, alphanumeric, integer or decimal. The number of columns is from 2 to 10 and the records may contain a maximum 44 - 60 characters depending upon the number of columns used. Columns may be of any width within the screen capacity but integer or decimal columns more than five or six characters wide respectively will not have the option of searching within a range. The program consists of two parts. The first is used for entering the data and the second for the sort or search. The second part overlays the first when it is loaded so only 4K of memory is used by the entire program. The remainder of your memory space is available for data. The amount of data that can be contained will of course depend upon the amount of memory available, but as a rough guide a 16K user will be able to manipulate at one time 250 records of 39 characters each or 514 records of 17 characters each. As a further rough guide on sorting speed, the time to sort 1,000 records on fields of random strings of random length, or of random number between 1 and 99,999, averages under 2½ seconds. Numeric columns either integer or decimal may be arithmetically manipulated almost instantaneously. A total may be cast or an average taken for any numeric column up to five digits. This is so fast that when adding 1,000 numbers totalling over 50 million, only a slight hesitation can be noticed before the total is given. In summary, therefore, this program is ideal for any application concerning the manipulation of information whether it be business, personal or hobby which can be comfortably displayed as one record per line upon the screen and in respect of which it is required that super fast searches or sorts be carried out. The program is supplied on cassette. At this time it is not compatible with disk systems. A disk version is in the course of preparation. The cassette includes a set of data randomly generated which can be fed into part 2 of the program to demonstrate the fantastically fast sort and search features. Also available for the Video Genie.

Note to 1982 Catalogue Re-write

Instant Sort/Search grew from the above description to become one of our most successful programs. There have been many upgrades, additions and alterations. The original program was quite early on transferred to disk and has been made fully compatible with TRSDOS and LDOS and, so far as we know, the NEWDOS 80. In July 1981 a new module was added, ISS3, and now as this 1982 re-print is going to press, a new module, ISS4, is shortly to be launched. It may also be of interest to note that ISS is one of our programs that has been accepted for publication in the United States. It is, of course, compatible with both the Model I and Model III. The most important upgrade was the addition of the module ISS3, a description of which follows:-

1) The ability to exchange or swap columns. If, for instance, one has ''name'' as column 1 and ''age'' as column 2 in an existing file, these can be exchanged so that ''age'' is the first column and ''name'' the second.
2) Delete a column — This is self explanatory. The important point is that the space made free by an entire column throughout the file can be quite large and is added to the amount of free space for the program to use. In other words, by deleting a column the data file is shortened.
3) Add a column — Again self explanatory. This is the command by which a new column can be added.
4) Extend a column — The number of characters in a column can be increased with this command.
5) Reduce a column — The reverse of the previous. This can be a particularly useful command when not all of the spaces in a column have hitherto been used. In other words, there is a large amount of blank space in the file because of these unused characters. With this command this blank space can be converted into usable space.
6) Rename a file — This command allows the file to be renamed, and, of course, subsequent saving of it will reflect this new name and new update base.
7) Renumber — This enables the base number of the record numbers to be changed. Hitherto with a base of 0 the records have started at 1. With this command they can be changed to start at any number less than 7000.

These improvements have required that the program location be changed somewhat, so re-locater programs are included so the previous data can still be used. There have also been one or two enhancements to ISS1 and 2. The sort is now (believe it or not) a fraction of a second faster. Just after the last list went out, some improvements were also added to ISS2. These were incorporated in version 2.02, but have not been mentioned in a previous catalogue listing. The improvements permit the user to ''mark'' certain records whilst in ISS2 for either a change or a delete. After the marking has been done, the program is taken back to ISS1 whereupon the records marked come up automatically at the beginning of the run for action.
Instant Sort/Search is now an extremely powerful speciality database optimised for fantastically high speed sorts. The new improvements probably take it a little way over towards a general database giving it a wider appeal, but it should be borne in mind that it remains a database for customers who require extreme high speed of sort.
In addition to the improvements mentioned above, ISS2 for both the Model I and Model III versions have been speeded up and tests with random data now show files of up to 500 records are sorted on any one of up to 10 columns, numeric, alphabetic or mixed, in one second or less. Even with a thousand records the sort time is still under two seconds!

use, the VARPTR command for instance would be worth looking at. Space is restricted in this column and we aim to titillate as well as instruct so have a look at the following easy way for a very simple example:

```
10  A$ = "ZZZZZZ"              'load dummy string
20  PRINT A$                   'check still there!
30  FOR C = 17129 to 17149     '17129 is start of
                               Basic storage area
40  IF PEEK(C) = 90 THEN POKE C,191  'explained below
50  NEXT                             'close loop
60  PRINT A$                         'my how we've changed!
```

Line 40 is the guts of it. It looks for the first and further appearances of 90 (ASCII code for Z) and when it finds them, changes to 191 or a complete graphic block set. Now list line 10 and see that it is full of USINGs. You guessed it — the token number for USING is 191.

FEBRUARY LISTING

ASTRO NAVIGATOR — NOT JUST A SPACE GAME

This is one of the most fascinating games that we have ever published. In fact it is so good that one can hardly call it a game, it is better described as a simulation. Coming as it does shortly after the recent successful Voyager probe to Saturn, it is particularly well timed. The software, programs the TRS-80 or Video Genie to produce a complete and highly accurate simulation of the solar system. All of the orbits of the various planets are correctly calculated, as are their orbital speeds and gravitational pulls. Each time the game is played, the members of the solar system are differently placed, but still in correct relationship to each other and to the sun. Hence every game is different and presents different problems to the player. There are only one or two small deviations from actual fact. One is that each planet has a mythical shuttle orbiting it from which, if you can get into orbit with the planet, you can draw fuel and so continue your journey. The purpose of the game is to blast off from the planet of your choice and travel throughout the solar system. There is no other purpose. There are no prizes, no free goes, nothing else. If you succeed in making a landing on another planet then your reward is the thrill of having been able to do so. And for some inexplicable reason, it really is a thrill. Probably the reason is that the game is unbelievably difficult because all of the physical laws and relationship are obeyed. Not many people are able to blast off from Cape Canavarel and those that have done so have been aided by automatic guidance systems. Although the player of this game has the help of a computer, it will only tell him the statistics of the journey. A typical print out is shown below. It is for the player to decide how much fuel to take on, what thrust to use, whether to try and blast off slowly so that fuel can be taken on at the orbital station (this, incidentally, is mandatory where the gravity is very high, such as Jupiter as it is not possible to take off with enough fuel to attain escape speed and still have some fuel left with which to make your journey) or whether to try and get away from the home planet as quickly as possible. Apart from the flight data shown below, the astronaut has three maps to which he may refer. The first is of the outer planets, the second of the inner planets and the third a close up view, if he is in the proximity of any planet. Superimposed on these maps is the present position of the spaceship together with the last few positions which have been occupied. It takes a considerable degree of experience to play the game in order to make any headway with it at all. One has to get used to a whole new mode of travel where the attitude of the craft may bear no relation whatever to the direction in which it is travelling. At all times gravitational pull, the laws of momentum and many other considerations are acting on the craft's course. Furthermore, journeys are judged in lengths of months and years. For instance, if you take off from Earth and have a look at the map to see where Jupiter is, then point your craft in that direction, and blast, there is not the slightest chance that you will get anywhere near Jupiter because by the time you get there it will be long gone. Just as the Voyager used Saturn to pull itself, like a sling shot, onto a different path so the player of Astro Navigator can use the gravitational pull of planets to change course without having to use valuable fuel. Most of the time, of course, the craft is not under the control of its motors at all, but is coasting through space, affected, as we have said, by many different laws of nature as it goes. Frankly, we are not sure why the game is so appealing, graphics are used but are really only subsidiary to the play. Probably it is the simple fact that one is entirely on one's own out there and will fail or succeed entirely by reason of one's own skills. For what it is worth, it is one of the very few programs in which we got so engrossed when testing it, that the session has gone on ever since! Astro Navigator is written in Basic for 16K cassette, but is also compatible with Disk Basic.

```
                    FLIGHT DATA

FLIGHT TIME:     0  YEARS          81  DAYS          0  HOURS
                 2  MINUTES                11  SECONDS
VELOCITY:  523.795 KM/S            PATH ANGLE:  179 DEGREES

FUEL REMAINING:    699980  KG           ATTITUDE:   45 DEGREES

NEAREST BODY: SATURN ,  3.38604E+09  KM AWAY. PATH ANGLE:  158 D
EGREES
                    PRODUCING ACCELERATION OF 3.31436E-09 M/SEC2
BODY WITH STRONGEST PULL: SUN ,  3.70694E+09  KM. AWAY
                    PRODUCING ACCELERATION OF 9.69332E-06  M/SEC2
```

BASKETBALL — A REALISTIC SIMULATION

Another highly graphically orientated machine language action game with sound. Each game last four minutes and either two players take part or one player plays the computer. The graphics are based on a three dimensional depiction of a basketball court on which there are two players. One is controlled by each human player if two are playing, or when a human player plays against the computer the home player is controlled by the computer. The appeal of the game is its realism. The court player may be controlled in one of four directions, may dribble and shoot for the basket. The player who scores the most baskets in the four minutes of play wins the game. Available on cassette for 16K machines and for the Video Genie. Also available on disk requiring a minimum of 32K and a single drive.

QUAD — MIND BENDING

Quad is three dimensional noughts and crosses. As its name implies, it is played on a cube of four layers each with four ranks. Like noughts and crosses, the aim of the game is to get crosses or noughts in a line either horizontally, vertically or diagonally. The cube is depicted graphically on the VDU and either two players may take part or a single player may play the computer. Four levels of difficulty are provided and a time clock is also included for each move. A particularly important feature of the game is that the cube on which the game is played may be rotated so that the player can see it from a different angle. A number of commands are provided including setting up previous positions, backing up to a previous position, progressing to the next position, reversal of order of play and switching of opponents. This is a complex game of strategy in which the player will need all of his skills. Available on cassette for 16K machines and for the Video Genie. Also available on disk requiring a minimum of 32K and a single drive.

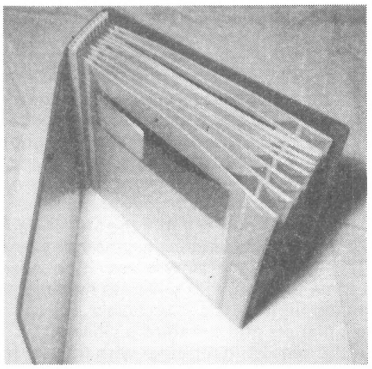
INSTANT SORT/SEARCH DATABASE — UNBELIEVABLY FAST

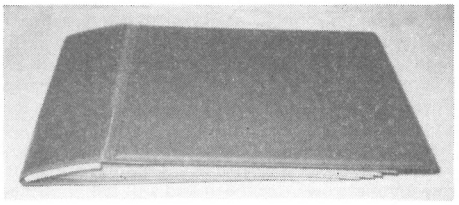
Everything in electronics takes a finite time, consequently nothing can be instantaneous. However a database that will search 500 records and sort the names into alphabetical order in 1½ seconds, that will go on to do the same thing with 1,000 names in only 2½ seconds, is fast. If you add to that the ability to search 500 or 1,000 records for a specific range of names or ages or sexes or whatever, in

BLINK — BASIC LINK FACILITY

Blink provides the capability of passing control from one Basic program to another, maintaining all currently existing numeric and string values. With Blink the user can transfer (or chain) from one Basic program to another by executing a simple command. Blink preserves all current variables from one program to the next. Common data can be easily passed from one program to another simply by using the corresponding Basic variable names. The chained programs can either be larger or smaller than the calling program. Blink will expand or contract the contents of memory as required. The chained program can either completely replace the original program or can be merged by statement numbers. The merge option allows just a section of the program to be replaced, for example, a subroutine. The statement number where execution of the linked program is to begin can be specified. Thus, the linked program can start execution at any desired location. Blink will co-reside with other machine language programs as a special loading program is provided that allows the user to position Blink wherever he desires. So far as we know this is the first time that a utility such as this has been made available for a microcomputer. Although comparatively low in price this program provides an extremely powerful tool to the programmer enabling him to connect any number of Basic programs, which although could be connected hitherto, could not exchange variable contents between each other. Thus a program which up until now could not run because of insufficient memory can now be split into a number of different modules, which will interact with each other.

DISK BINDERS





These binders are expensive, but are possibly the best type of storage which you can buy for 5¼" disks. They may be used either on a desk top environment or to carry the disks from place to place. The binder has room for 20 disks and is extremely sturdily made. Only the best materials have been used. The sizes of the pockets are such that they will take a cardboard sleeve in addition to the disk and two small storage pockets are available with regard to each disk for cardboard or paper inserts which are not supplied. When the binder has disks in it, it will stand up and fan quite easily, but when it is empty, it will lay almost flat as shown in the photographs. A small plastic pocket is supplied on the spine for any card insert and also a plastic pocket stretching the full size of the binder is available inside each cover. The binder measures 8" × 6½" and the width of the spine is 2½". If you want deluxe storage for your disks, this one is for you — and what a super Christmas present it would make!

This book, "Microsoft Basic Decoded and Other Mysteries" is the definitive work on Microsoft's Level II Basic and gives full details of disassembled Level II ROM. It contains more than 6500 lines of detailed comments contained in 124 pages. In addition, there are six chapters covering every single ROM routine in depth. The book is being published by the same company that produced "TRS-80 Disk and Other Mysteries" described on page of the catalogue. The book is being published in the United States on December 15th and we hope to have stock in time for Christmas, but we cannot, of course, guarantee this. We are, however, accepting pre-publication orders now. As we have not yet seen a copy, we are unable to go into further details, but we think the reputation of the publishers with regard to their previous book on the TRS-80 Disk System is sufficient recommendation. The sales literature which we received from the publishers state that "rumour has it that these comments are more complete than those of the original source code!" Flow charts are given for all the major routines, giving the reader a real insight into how the interpreter works. Microsoft copyright is not infringed by this book as the user has to supply the actual disassembly. If any purchaser does not have a disassembler already, in order to promote this book we are offering our Disassembler (described on page of the catalogue) at half price, namely £6.00 plus 90p. VAT. This offer is only available when the program is purchased with the book.

HINTS & TIPS Dec. 1980

The last Hints & Tips was mostly concerned with news, so this month I will try and keep to hints as such. I owe someone out there an apology because they sent in the tip that the Break key should not be disabled if the AUTO command is likely to be used and I forgot to make a note of their name. This is a good point as without the Break key you cannot get out of AUTO. To disable the Break key in Level II various numbers can be POKEd into 16396 of which 7 and 23 are the first two. In NEWDOS a zero should be POKEd into 23461. I always thought that a zero POKEd into 23692 under TRSDOS would disable but on just trying this it did not seem to work, so more on this at a later date! Often a JP (Jump) command is made to 1A19 to get back into Basic from machine language, I think a better jump is to 0072 — both in hex of course — as there are some circumstances in which 1A19 can give a problem. Users are often confused by the odd looking string loads used in some programs. A$ = "ENDENDEND and so on does look a bit peculiar at first sight! These strings are used for a number of purposes, most commonly for graphics and to load machine code, the latter often to accomplish sound effects. As there seems to be considerable interest, I will try and explain the former this month and the latter next time. Basic keywords are stored in memory as "tokens" (a list of them is now contained in the newer Level II Basic Manuals at page E/1 — photostat on request) which is a single byte from decimal 128 to 255. Hence when your program contains the command PRINT, this is actually stored as B2 hex or 178 in decimal and not as the word PRINT. The decimal number used with CHR$(nnn) to display graphics uses some of these numbers, from 128 to 191. PRINT CHR$(191) for instance lights up an entire block. If we load a string with dummy bytes and then go into actual memory and change them to the hex equivalents of the graphic numbers, when the string is printed we will get a graphic "picture" rather than the dummies which we put in originally. The trick is to find the correct addresses in memory to change. If you have a Monitor then it's easy, you can operate at the memory level. If you do not however all is not lost, there are still a few techniques you can

Double density, incidentally, is called by typing PDUBL on power up. No parameters are required and it may be incorporated into the various automatic fire up functions of LDOS.

CMDFILE

This utility remains essentially the same.

CONV

This is a new utility for converting files from a Model III TRSDOS disk on to an LDOS formatted diskette. A number of switches are permitted enabling the easy conversion of files. For instance, one can call for the conversion of only either visible, invisible or System files. One can also convert files only if they do not exist on the destination disk or only if they do exist on the destination disk. The user may call for the QUERY switch so that the program asks him whether or not a conversion is required when each file is met. This utility is also relevant to Model I owners, but they will have to have double density hardware in order to use it.

HITAPE

This utility is relevant to Model III only and will permit the use of high speed (1500 baud) cassette rates in LBASIC and CMDFILE programs.

LCOMM

Basically unchanged.

LOG

Log is a program that will log in, the directory track and number of sides on a diskette. This provides a method of logging in diskette information and updating the Drive Code Table. It performs a similar function to the DEVICE library command except that it performs this function on a single drive rather than all drives. It will also provide a way to swap the drive 0 diskette for a double sided diskette.

PATCH

Essentially unchanged.

REPAIR

A utility program to update incorrect information on certain types of diskettes to make them usable by LDOS. This provides a very convenient way of updating the Data Address Mark for the directory track. It is beyond this description to go into all of the problems that have arisen with disk operating systems because of the original misunderstandings on the DAM. REPAIR will read enable DIR/SYS and check and correct the excess cylinder byte, set the grans/cylinder byte, strip the high bit from the boot sector directory track byte and finally write LDOS system information sectors on to the disk. All of this is a little technical, the principal functions are that on the Model III it is used to read a non LDOS disk. On the Model I it is a general purpose utility as it will not be necessary, usually, to repair alien disks, although non TRSDOS compatible features may be repaired.

GENERAL

It is important to note that Model I disks created under LDOS 5.0.3 are directly portable to the Model III 5.1 and vice versa. In other words, one can literally take the disks out of one machine and put them in the other.

JCL

The job control language in 5.1 is very similar to that in the 5.0.

DEVICE DRIVERS

JL

This driver enables the LDOS job log feature. The job lot will send a list of all commands and error messages along with a time stampt to a specified file or device. Certain other information such as file names moved during a backup will also be logged.

KI

The keyboard driver has been changed in various aspects. A typeahead feature is included. With the KI driver set the keyboard can produce the entire ASCII character set from 0-127.

RS-232

There are three RS-232 driversnow, one for the Model I TRS-80 interface, the second for the Lobo LX-80 interface and the third for the Model III.

DEVICE FILTERS

MINIDOS

The Minidos command is a keyboard filter that provides constant access to certain LDOS commands such as Directory, Free Space, Kill and Debug. An immediate top of form function is also provided for use with line printers. Additionally the clock may be toggled on and off and a character can be sent to the line printer. This is in the form of two hexadecimal digits and will therefore allow the user to send control characters to the line printer to switch printing modes etc. A Minidos R command is available for repeating the last issued DOS command.

BASIC

The 5.0 version of LDOS did not contain a Basic, partly for reasons of cost, but probably more importantly because of space, there simply was not room on the original disk for it. Now that Logical Systems have been compelled to go to a two disk DOS anyway, an entirely new Basic has been incorporated called LBASIC. It must be emphasised very strongly first of all that LBASIC is entirely upward compatible with Microsoft Basic, that is to say, the Basic found in the interpreter of the TRS-80 and Genie machines. LBASIC is a very powerful language and its compatibility with Microsoft Basic already mentioned makes it even more so. It is very tempting merely to describe it by saying that it includes most of the improvements which have been made to Microsoft Basic by various disk operating systems. However, a few other details no doubt will be appreciated. All of the improvements mentioned under the heading ''LBASIC'' on page 68 of the catalogue are, of course, included. The renumber and cross reference features have been changed and improved somewhat. An interesting new feature is the ability to protect programs with an ''execute only'' password. This means that the program may be run, but not loaded, listed or listed to the printer. Any attempt to break the program execution and examine it will cause it to be erased from memory. LBASIC now supports variable length files or blocked file mode, as it is otherwise known. This permits files with logical record lengths of less than one sector to be created and accessed. Any record length from 1 to 256 bytes will be allowed, even if the record length size is not evenly divisible into 256. Blocking and deblocking across sector boundaries is done, of course, automatically by LDOS. In this way user records can span across sector boundaries and thus make most efficient use of disk space. The very nice new random file controls (RN etc.) described on page 68 of the catalogue remain, as do the new sequential file controls for adding to sequential files. A completely new feature allows the LBASIC programmer to single step through each program with a hold after each step. It is used by pressing the Shift @ which will cause LBASIC to go into the normal wait state, but if whilst continuing to hold these keys down, the space bar is pressed, the next LBASIC statement will be executed, then go into another wait state and so on. This attractive feature, incidentally, is also available when listing a program. Needless to say, LDOS library commands can be called from LBASIC with the CMD command. These library commands must not, however, affect high memory. Additional CMD commands are as follows:

CMD''*''	Sends the screen display to the printer.
CMD''A''	An abnormal return to LDOS. Any active DO command will be cancelled.
CMD''B'', ''switch''	This command will enable or disable the Break key.
CMD''D''	Accesses the system debugger. A useful extension of this normal command is the adding of a switch so that the debugger may be turned on from LBASIC but not entered. The debugger is entered by pressing the Break key later.
CMD''E''	Returns the last LDOS error message in the usual way.
CMD''I'', ''dos-command''	Exits from LBASIC, passes a command to LDOS and stays there. In other words, effects an exit from LBASIC with the execution of an LDOS command and no return.
CMD''L'', filespec	Loads a Load Module Format file into memory.
CMD''N''	The renumber feature.
CMD''O''	This command must be followed by two parameters. It will sort a single dimensional string array starting at the element specified and sorting the number of elements specified.
CMD''P''	This command is followed by a variable and when executed will return the printer status to the variable specified.
CMD''R''	The Model III version of 5.1 command turns on the clock display. In the Model I it enables the interrupts feature after tape load or save. It must of course be done after every CMD''T''.
CMD''S''	Normal return to LDOS.
CMD''T''	The converse of CMD''R''.
CMD''X''	The LBASIC cross reference utility.

New LBASIC commands are as follows:

RESTORE nnnn	This command is similar to a regulate Restore command except that a line number may be specified. The data pointer will be moved to the beginning of the specified line and any subsequent READ statement will start accordingly.
RUN''filespec'', V, line number	The V parameter when added to the normal RUN command will allow the saving of all current variables and string space when running a new Basic program. A line number may be optionally given to start execution of the new program at the specified point.
RUN''filespec'', line number	The addition of a line number to the normal RUN command starts execution of the new program at the specified line number.
SET EOFn	This command allows a file to be opened in the R, RO or RN mode to have its end of file marker reset.

Various patches are supplied in LDOS to make certain well known programs run under it. In particular, Scripsit is supported, as is Visicalc. Apparently Electric Pencil is no longer available from the manufacturer (we can neither support nor deny this statement of Logical's as we have never sold this word processor) so no further fixes will be required. One fix is supplied and when used enhances Pencil to some extent, in particular to make it honour high memory. The Pencil version to be used must be the original one with no other patches applied. The debug utility contains a zapping feature. This is fairly rudimentary. Our Prozap has now been made compatible with the Model I and Model III LDOS 5.1. Two final points. When first describing LDOS we rather chastised them for using the term ''cylinder''. Now that double sided disks are supported, the importance of the phrase is fully understood. The tracks can be considered as going straight through the floppy disk in the mode of a cylinder, in other words, the disk is not looked at as two sides of one media by the system. Each track is merely elongated, thus a track which previously had 10 sectors, on a double sided disk will have 20 sectors. It is difficult to over-emphasise the importance of this as it makes the handling of the disk and its contents very much easier for the user. Finally, the already superbly prepared manual has been greatly enhanced, so much so that the binder supplied with it is now no less than 3" thick at the binding. We have not counted the pages, but they must be close to 300 or 400. Quantity, of course, is not everything, so it should be emphasised that the quality is there as well. The description of the entire system is excellent. We have not come across any criticisms of the contents of the manual at all. It is written in English with little computerese. Thus an extremely sophisticated disk operating system has been made as simple to understand as is possible. The technical people have not been forgotten as the technical section has been further extended. Of particular importance in this context is a memory map of all the system vectors that could reasonably be used by any accomplished assembly language programmer.

WORD WARS — TWO GAMES ON ONE TAPE

The title of this program is a collective one for two individual programs called Word Challenge and Word Game. Not unreasonably, they are both concerned with the guessing of words or letters. In Word Challenge, the length of a phrase is shown, thus indicating the number of letters it contains. Player or players must guess the letters making up the phrase which constitutes the challenge. In the two-player mode, there is an option for each player to input the phrases which the opponent must guess. Word Game involves guessing letters and making up words. Again, one can play against the program or two players can compete against each other. Points are based upon frequency distribution of a letter in the English language. The programs provide sound. They are supplied on cassette, but are Disk Basic compatible.

IMPAKT — THE COMPLETE PROGRAMMER'S AID

The rather unusual title of this program has been chosen so as to have impact and to differentiate it from the less extensive ''tool kit'' type of program. The suite is made up of four broad categories of utilities. In the aggregate they comprise a complete utility containing every foreseeable feature that a Basic programmer could require. It is written by Nigel Dibben in his usual efficient way and some indication of the complexity and completeness of the program is given by the fact that even Nigel has been working on it for some months! Up until now, very useful utilities have been sold by us separately and, of course, we will continue to do so, but for some time it has become obvious that there is a market for a program that does everything. The original idea for the compression section came from software which has been written for the Model II which is featured elsewhere in this catalogue as ''Skrunch'' and ''Compress''. So that customers who own utilities at the moment do not have to duplicate more than is absolutely necessary, this suite is being sold in three versions. The first contains the Compression and General Purpose sections (IMPAKT 1). The second contains the Debug, Edit and General Purpose sections (IMPAKT 2) and finally, the composite program (IMPAKT) contains them all. The disk version contains all three programs. We will deal with these sections separately as follows:

COMPRESSION

Remove Remarks

Any or all of the following may be done.

Remove all statements in a Basic program starting with REM.
Remove all statements starting with an apostrophe.
Remove all statements starting with REM #. This is a special mark used in the renumbering routine of Impakt.

Remove Surplus Characters

Either or all of the following functions may be carried out.

Remove all blanks, tabs and line feeds in program statements, but not those in any strings or data statements.
Reomve all redundant colons.
Remove blanks in data statements.
Remove all redundant GOTO's after THEN.
Remove all LET statements.
Remove all quotation marks at the end of lines, except in certain circumstances.
Remove all characters after the second in a variable name — thus WAGES becomes WA.

Pack the Program

Any or all of the following functions may be carried out.

Pack lines together so that each line in its expanded form will occupy no more than 240 characters. Lines will only be packed if they remain syntactically correct. The effect of this, of course, is to join what were single lines into multi-statement lines.
Pack lines into a dense format with no more than 240 bytes per line, but when expanded the line may well be longer than 240 characters. This, incidentally, results in a completely uneditable line.
As (a) but with user definition of the number of bytes to be packed.
Unpack the text.

DEBUG

Trace

The following functions may be carried out.

Activate a Trace function with continuous display of the last 8 lines operated upon **at the top of the screen.** This does not use the normal TRON feature of the Tandy Basic whereby the screen is effectively erased by the line numbers being displayed. The numbers are shown at the top of the screen.
Remove the Trace function.
Activate the Trace with a line by line automatic pause.
Activate the Trace with a step by step pause.
Leave the Trace active, but suspend the display. The line number record will be kept up to date and can be inspected.
Disable the Impakt Trace function, but enable the Tandy TRON. This makes an interesting comparison.

A number of control options are available whilst a Trace is proceeding, the effect of which is essentially the ability to switch from one control mode to another.

A number of pause options are available during the Trace so that during the pause, the user may pause and:

Display the current line.
Display the current step.
Switch on or off the option to have the current step displayed at all times.
Enter Edit mode automatically in the current line.
Abort the program.
Clear the screen.
Enter a breakpoint sequence.
Breakpoints may be inserted in the program so that when the Trace reaches them, it stops and all variables etc. are then available for inspection.

View Data

With this function the expressions will be stored during the Trace and will be displayed on the second line of the screen so that the values contained in the expressions may be inspected.

EDITING

Abbreviation Mode and Special Key Functions

The following functions are available.

Sets shifted keys to preset abbreviations. In other words, a shorthand feature whereby — for instance — a shifted L will display LIST on the screen.
Disable the Abbreviation Mode.
Display the current abbreviations stored.
User define the keys. This feature is not restricted to commands and a shifted letter may be equal to any string of 15 or less characters.

Find and Count

Locate the occurrence of a parameter specified by the user. The numbers of the lines containing the occurrence are displayed with the figure in brackets showing the number of occurrences in the line if greater than one.

Find and Wait

Similar to the above but a pause is executed when the occurrence is found. A number of special commands are available including the ability to abandon the search, reset from the first line, delete line display, automatically enter the Edit mode for the line displayed and continue to search.

Find and Replace

Again, similar to the above, but when the occurrence is found, it is automatically replaced by a user defined expression.

Join Lines

With this feature any line may be appended to another line with the automatic insertion of a colon.

Line Checking

Any or all of the following features may be carried out.

Mark all reference lines with a special form of the REM statement.
Remove all marks inserted under (a).
Check all lines for referencing and display any errors.
As (c), but append two asterisks for easy search.

Copy Lines

Copy one line to another. If the line being copied into exists, it will be overwritten. The line being copied is not changed. With this feature any existing line may be duplicated in another part of the program.

Append Text

With this feature the programmer may close off the current program and enter from the keyboard or from tape or disk a new program. Thereafter the ''block'' may be removed so that the two programs become one.

Decode Lines

This is a useful feature which has come about by the continued use by programmers of the technique of entering graphics and machine language into packed strings. The feature will decode the strings into hexadecimal code and add them as new lines at the end of the program. A number of variations are available to this routine all of which are aimed at making the manipulation of packed strings more easy.

GENERAL PURPOSE

Disk Program Save/Load

This function is provided to enable the quick saving of backup copies of programs during editing and debugging. It is only necessary to type in a three letter command for the program to be saved under the file name TEMPROG/BAS. This feature, of course, is not available under Level II Basic.

Exit from Compak

Two exits are permitted. The first will restore all vectors and pointers intercepted by Compak to their proper states and then execute a return to Basic. The second exit is to DOS with or without a DOS command being appended. This feature is not available for Level II.

Renumber Program Lines

This is, essentially, a normal renumbering program, but it has one or two extra features. In particular the sequence of renumbering may be changed anywhere in a program. This is accomplished by a special form of REM statement being inserted beforehand. When the renumbering routine reaches this statement, the renumbering increments will be changed to a user defined value. If a line number is found containing a reference which does not exist, the old number and old line number will be displayed and two asterisks will be placed after the offending number. Line numbers marked by the programmer in a certain way will be omitted from the renumbering sequence.

Status Report

Display in decimal the space allocated to the following:

Program	Array names and values
String variables	Free space and Basic stack
Variable names and values	Total of all

Rescue

This feature will attempt to rescue a Basic program lost through an inadvertent reboot, the inadvertent use of NEW etc.

Copyright and Release Number

Displays the copyright and release number of the program.

Control Key Functions

Control keys are used throughout the program for various functions. The control keys are used to provide the following functions:

Convert from upper to lower case. If this is not set then the alpha keys will be shown as capital letters and shifted alpha keys will use the abbreviations previously mentioned. If it is set then alpha keys will be displayed as lower case and shifted alpha as capital letters assuming the hardware modification of course.

When set all display characters in the range ASCII 32 to ASCII 127 plus line feed and carriage return are copied to the printer. Screen display is not affected.

This function duplicates the control Z feature which is required in a number of programs particularly in NEWDOS Basic.

A convenience function returning ASCII values 91 - 95, which are the cursor keys and used in search options.

The programs are available for Level II or Disk Basic (should be specified) and are compatible with current Video Genies.

Note to 1982 Catalogue Re-write

Impakt is now available for the Model III. Changing it over to that machine provided the impetus to improve the program slightly. A principal change has been to make the program automatically relocate itself on execution. It loads and relocates to the top of the current available memory. Impakt is now compatible with LDOS. One or two command changes have been made, some of them cosmetic. A new command has been added to enable the easy moving of a block of Basic lines from one part of the program to another. Another new command automatically converts all text in the program which is contained in quotation marks in a string into lower case. This facility is to enable speedy conversion of upper case messages into lower case.

FAIRYTALE ADVENTURE — IN BASIC YET!

When one comes to think of it there really is no reason why an adventure should not be written in Basic. Some of the earlier ones were but they were not particularly good. However, that was before the microcomputer machine language adventures became available, which, as we all know, created something of a standard in the ''industry''. We elected to publish this Basic adventure because it was written with the hindsight of the machine language program and indeed, it follows the general layout of them quite closely. There are really only two objections to a Basic adventure. The first is a question of speed and the second of security, not in the sense of copying, but in the sense of being able to cheat by listing the program and looking at the strings. In this Basic Adventure, at any rate, the speed point is really pretty well overcome. It is certainly true to say that there is some delay after an instruction is entered before the computer complies, but it can only really be called a hesitancy on the computer's part. We feel that it does not seriously detract from the enjoyment of the game. The author, Mr. K. D. Campbell, has overcome the second point by disabling the Break key at the beginning of the game and enabling it at the end. Obviously, this can be overcome by a knowledgeable user, but at least it will go some way to stopping an unscrupulous player from getting a listing whilst the game is in play. Subject to the foregoing, we do not think that the game really suffers from being written in Basic and we would certainly be interested to hear our customers' views on it. The game is aimed at family participation in that its theme is fairy stories and nursery rhymes that all interconnect to provide ''souvenir'' treasures from the stories. Thus it is hoped that the children will be interested in the stories, whilst the parents will probably be required to provide vocabulary and perhaps ''adventure experience'' in solving some of the problems. The game has thirty-six locations and over thirty moveable objects. The player will have to travel through secret passages, grottos, waterfalls, caves, candy houses and many other interesting locations.

ZORK — FROM PERSONAL SOFTWARE

Personal Software say that Zork is more than an ''adventure'' and we feel that this is probably a fair statement. Rather like the original adventure it is evolved from a main frame computer and is probably better described as a computer fantasy rather than a straight adventure. Apart from the scenario which we will describe in a minute, the principal advantage of Zork over a standard adventure is the increased vocabulary and sentence syntax. Some of the added comments are as follows:

AGAIN	Zork will respond as if you had repeated your previous sentence.
BRIEF	This command enables Zork to fully describe only newly encountered rooms and objects. Rooms already visited and objects already seen will be described by printing the room name and the object name only.
DIAGNOSE	You are given a medical report of your physical position. This is particularly useful if you have just survived a dangerous battle.
LOOK	Zork describes your surroundings in detail.
RESTART	The game ends but restarts at the beginning.
SUPERBRIEF	This command tells Zork to show you only the name you have entered and no other information. It is briefer than BRIEF.
UNSCRIPT	UNSCRIPT stops your printer from printing.
VERBOSE	This command tells Zork to issue you a long description of the room and the objects in it whenever you enter a room.
WAIT	This causes time in the game to pass. Normally between moves no time is passing as far as Zork is concerned. WAIT is used when you want to find out what will happen whilst time passes. For example, if you encounter an alien being, you might WAIT and see what it will do.

As mentioned above, the sentence syntax has been considerably enlarged. For instance you may use multiple objects of a verb although they must be separated by entering an ''and'' or a comma. For instance, the sentence ''Take all but the knife and the lamp'' is legal as

would be ''throw the newspaper, the red box and the magazine in the chasm''. Furthermore, several sentences may be input in one line so long as they are separated either by the word ''then'' or a fullstop. Thus ''Take book. N. Drop book and candle'' is permissible and is equivalent to ''Take book then N. Drop book and candle''.
A handy feature is that the location in which you are situated, your score and the number of moves are continuously shown at the bottom of the screen. Also, if the computer's response is greater than the screen will hold, the word ''more'' will appear at the righthand bottom of the screen so as to tell you to hit the Enter key for more description.
The Kingdom of Zork is a great underground empire comprised of a fantasy world where your survival will depend upon your wits and courage. Mystery, monsters and magic will test your skill in an alternate universe of danger and opportunity. Like other adventures, the player directs all the action, discovers the secrets, fights the battles, solves the mysteries and ultimately claims the treasure. Due to increased vocabulary and sentence syntax, the player gets more of a feeling of being in the situation and although perhaps slightly overstating the situation, Personal's claims that '' you and your computer are involved in vividly described, compelling, fantastic situations'' is, to a large extent, true. The program is disk orientated and is far too big to go on a tape and a partly played game may, of course, be saved. A rather unique feature which, so far as we know, is not available on any other adventure, is the ability to print out all commands and responses to a line printer. One merely enters the command SCRIPT and thereafter the player' commands and the responses from the computer are routed to the printer in addition to the screen. Although Personal Software have priced Zork rather high, it is a unique adventure and is probably worth the price.

THE ELECTRIC ACCOUNTANT – FOR PERSONAL OR BUSINESS ACCOUNTS

This is a general purpose income and expenses program which may be used for VAT registered companies as well as private individuals. Essentially, the purpose of the program is to maintain datafiles of income and outgoings. This data is held on a monthly basis and these, of course, are also divided into years. Each year is assumed to run from April of one year to March of the succeeding year. Thus, assuming that the years are appropriate to the user, twelve files would be kept for 1980/81 running from April 1980 to March 1981. The data so filed may be manipulated by the user in a number of ways. The main menu for instance contains the following options:

Add new records.
Change records.
List records.
Print records.
Search records for data.
Display categories.
Change month.
Total income and expenses.

When appropriate, a further item is added to change the VAT rate which is, incidentally, stored on a month to month basis so that the VAT rate for any particular month is shown when that month is accessed. As will be apparent from the above list of options, the data is allocated by the user to one of twenty categories of expenses. These categories are defined by the user. Probably the best way to describe this program is to go through each of the main options above in turn.

Add new records
This option permits the user to add records to the file for the appropriate month. We should mention that one only gets to the menu stage after the month and year has been chosen. Hence, both the machine and the user know which month is relevant to the menu. When the 'add new records' option has been chosen the user may input either income or expenses. The machine will display the list of current categories and the user will input to whichever one he chooses. If the operator is registered for VAT then a number of additional options will be given. This program has, incidentally, been inspected by H.M. Customs & Excise and although they will give no official approval to any software, it has not been disapproved! After the category has been chosen the user is given the option to enter a sub-category. This feature is particularly useful for keeping sub-totals. For instance, under the main category of ''Car'' one can have a number of sub-categories for petrol, repairs, road tax etc. Thus a breakdown of total car expenses is available by sub-category and the user may find a total (for instance) of all expenses paid for petrol. Another very useful feature is that the user may enter ''notes''. Thus in the example we have been using the category of Car may have been split into a sub-category of repairs and one could add a note that the particular expense being entered was for a new battery. Other items of information may, of course, be substituted such as the data, or the cheque number. When the search function (to be described later) is chosen, the file may be searched for the item ''new battery'' and it will be found.

Change Records
This is an editing feature which enables any record to be changed as required.

List Records
This option will display records on the screen for the month in question. Either one record or all of them for that month may be shown. Additionally, all records in any category can be listed.

Print records
As above, but output is directed to the line printer.

Search records
This is one of the most useful functions of the program and allows the user to search through the notes of all records for that month for any item of information required. The program asks for the expression to be searched for in the notes and when entered it will be found if it exists. Thus, for instance, if one had entered cheque numbers in the notes, it would be necessary to enter that particular number for the program to find the appropriate entry. Duplicates will be displayed. Thus, for instance, if one had been having trouble with the brake system of a car and there were a number of notes against different items for it, then searching for ''brakes'' would bring them all out.

Display categories
Self explanatory. The categories are displayed on the screen.

Change month
After the user has finished with any particular month, he may use this option to change to another.

Change VAT
This allows the registered user to change the appropriate VAT rate.

Total Income and Expenses
After informing the computer whether a printout is required or not, a sub menu is displayed. We will not in this description go through each one for they are actually self explanatory. The options are as follows:-

All categories for the year.
All categories for a month.
One category for a year.
One category for a month.
Sub-category for a year.
Sub-category for a month.
VAT total for three months.
Taxable inputs and outputs for the month.

As can be seen from the above, this is a flexible accountancy system for the home or small business including an option for VAT registered owners. Accounts may be kept of all income and expenses generating a simple profit and loss account for the month or the year. To some extent it is similar to a nominal ledger. The program requires 48K and two disk drives.

PROJECT OMEGA – RUN EARTH'S FIRST DEEP SPACE COLONY

In that this description is being dictated on the actual day that the space shuttle is due to be launched, it is particularly appropriate that we should introduce a new space game whereby the player has to take the part of the Governor of one of Earth's first orbiting space colonies. Due to heavy pollution and mining operations ravaging at the Earth's landscape, together with an ever increasing world population depleting the Earth's supplies of raw materials, it has become obvious that heavy industry must be moved into outer space colonies where the solar winds could blow contaminants and heat out of our solar system and energy would be readily available from the Sun. The date is now 1990 and you are the Governor of one of Earth's first orbiting space colonies. So much for history! The instruction booklet contains a diagram of your orbiting colony. It contains no less than 150,000 tons of aluminium, 20,000 tons of glass, ¼ million tons of soil and buildings, plus ¾ million tons of lunar soil and industrial slag used to shield the inhabitants from harmful cosmic rays.

Part of the colony is made up of ''rings''. There are three industrial rings and three agricultural rings. To cut a very long story short, you have got to manage this colony so that all comes out well. The game is a highly complex simulation. There are roughly 180 pieces of information supplied to the player on his or her turn and 46 possible user decision for every round of the game. Such items as: migration, deaths, productivity, income, expenses, air, gravity, temperature, humidity, carbon dioxide, salaries, population and so on all inter-relate to make, as we have said, quite a complex situation. There is a lunar landing base thrown in for good luck. Although the Moon, of course, has lower gravity than Earth, it is still too expensive to use ships to carry soil from the Moon to your colony. Luckily, someone has come up with the idea of mass drivers that use magnetic impulses to hurl packets of compacted lunar soil along a track at such a speed that escape velocity is achieved. We would recommend this program to customers who like a really complicated mind bender. It is, to some extent, reminiscent of the Galactic series, although we must make it clear that the scenario is entirely different as we have attempted to describe. Tape and disk versions are available. The tape version is for one player, whilst the disk version supports one or more players and a special tournament version.

BACK-40 — A MACHINE LANGUAGE BACKGAMMON

This is said to be the best Backgammon available for the TRS-80 and for the Video Genie. No doubt there will be experts who disagree, but certainly to our uneducated eyes it seems to be very good. The graphic display of an official Backgammon board we would have thought is probably unrivalled for quality, clarity and ease of play. The dice rolls are even generated graphically. Mind you, as we say above, this is a machine language program so a lot of things can be done which are not available in Basic. Response times, of course, as one would expect, are extremely fast, usually less than two seconds. The program includes all features of a regulation Backgammon match including the rolling dice to determine who moves first, doubling for both the player and the computer and score keeping for a series of games. All moves, of course, are checked for legality and erroneous moves may be erased by the input editor. The game is, of course, played against the computer and it may be restarted at any time. An exit can also be taken to Basic if desired. When first starting up, the Backgammon board is displayed with points numbered from 1 - 24. The player's pieces are solid bars on points 1, 12 and 17 and 19. The computer's pieces are broken bars. The player's movement is from right to left, from 1 - 12 and then left to right on 13 - 24. The player rolles the dice by pressing the space bar. When it is legal to do so the piece on the Bar may re-enter the board by typing an appropriate command. Generally speaking it appears to be a very complete version of Backgammon and as mentioned above, at the moment, we have no reason to know of any incompatibility with current Video Genies. Tape and disk versions are available.

EVEREST EXPLORER — ATTEMPT TO CLIMB THE HIGHEST MOUNTAIN

At 29,028 feet, Everest is the crowning jewel in the vast Himalayan mountain range. It has represented the mountain climber's dream ever since it was first discovered by British Surveyors in 1852. For over a century it defeated some of Britain's best climbers until finally, in the Spring of 1953, Edmund Hillary and Tenzing Norgay reached the summit. Since then it has been climbed several more times and by several more routes. Nonetheless, it remains one of the most difficult challenges in a mountain climber's portfolio. In this game you take the place of a director of an Everest expedition and you must plan your assault in three phases: selection of climbers and equipment, establishment and provisioning of a series of camps and, finally, the direction of the ultimate assault on the summit. As with any expedition, you will have to live within the amount of money that you have been able to raise and as organiser, you will need to deal with six major expense items, namely, climbers, Sherpas, tents, oxygen, food and fuel. Everest Explorer is a fairly complex game in which a number of parameters have to be chosen just right, if you are to achieve the ultimate accolade at the peak. The route is obviously important and the timing, because of weather conditions, is all important. You must plan all of these matters and when you have finally established a chain of camps up the slopes, you will need well rested climbers. Their chances will be markedly better if they use oxygen, better still if each has two tanks. Even when, and if, you succeed in reaching the summit, you still have to get your climbers and Sherpas back down to base camp. The instructions come with a good drawing of Everest with the two major routes marked, together with the positions of camps. The program is available on tape or disk. A game may be saved for future use on the disk version. At the time of going to press, we are not sure whether this feature is also available on cassette copy.

PIGSKIN — THE AMERICAN SLANG FOR FOOTBALL

Let us get one point out of the way first of all. This game is concerned with the American game of football and not our far better English game of soccer! It is a football strategy game and is played on a graphic representation of the field. It contains most of the elements of the game. You can pit your wits against those of a friend, watch the computer play against itself, or play against the computer. The game and statistics are both graphically displayed and five levels of difficulty are provided when playing against the machine. A demonstration mode is featured whereby the machine strategy can be studied. A game may be saved for future use. Pigskin graphics are an essential part of the enjoyment of the game and before it actually begins, a number of statistics such as the time remaining in the quarter, 30 second clock, score board and so on will be displayed on the screen. Once play begins, the ball moves up and down the field to mark the yardage gained or lost. If you try for a goal and make it the ball will go through the uprights, when you run a play (whatever that may mean) time is taken off the game clock. Frankly, we do not know how good this program is as we have no knowledge of American football or the rules of it. It does seem fairly straightforward in play and, presumably, if one knows what one is doing, it can be enjoyed.

1981 EXHIBITIONS

As our older customers will know, we normally attend two London Shows, the Personal Computer World Show and the Microcomputer Show backed by Practical Computing. This year we have decided to put all of our eggs into one basket and have booked a double-size stand at one Show, namely the Personal Computer World Show to be held at the Cunard Hotel, Hammersmith, London, the same as last year, from the 10th to 12th September inclusive. As usual, we shall receive a quantity of complimentary tickets and any customer who is certain that he will be attending is more than welcome to write in after July for one.

MODEL III

As this listing goes to press, the Model III, at least in its tape version, should be generally available at selected Tandy stores. Our experience of both the tape and the disk versions of the machine have been good in that a larger quantity of our software appears to be compatible with both versions that we had first thought. We are in the process of preparing a list of our software which is compatible with both the tape and the disk versions and this should be available within a couple of weeks of this list going out. It will be published in the next list, but customers who have purchased a Model III in the meantime can write in or telephone and this list will be available free of charge to them.

PERCOM DATA SEPARATOR

The Disk Controller chip inside the TRS-80 Interface carries out its own internal separation of the data pulses from the clock pulses. This is not recommended by the manufacturer of the chip and is the cause of the common difficulty of ''hunting'' when a format or backup gets to the inner tracks. It is also the cause of many CRC Errors. Both problems are even more common with 77 track drives. For some time we have advocated the use of the Percom Data Separator which is a small printed circuit board which simply plugs into the socket previously used by the Disk Controller chip. As higher density drives are now far more common-even the Tandy ones now can go to 40 tracks - we are now stocking the Separator.

SHARE PORTFOLIO — A DISK SHARE MANAGEMENT PROGRAM

Elsewhere in this catalogue we described a tape orientated Share Portfolio program. Although not written by the same author, this one carries out a similar function for disk users. This Portfolio program is written by Dr. H.J. Campbell, who also wrote the Share Analysis program which follows, although they are not interactive in the true sense of the word. Although the disk contains three programs, shares, folio and sales, the latter two are included to give the new user dummy data upon which to operate so that he may get the feel of the program before actually using it. The main program is entitled Shares and when it is run the user is presented with a menu containing five choices as follows:-

1. To see present holdings
2. To make records of purchases.
3. To make records of sales.
4. To revalue present holdings.
5. To see records of buy/sell deals.

These are all pretty well self explanatory. If the first choice is made the user is given the option of either a screen display or a printout and then the data is presented in seven columns. The first indicates a buy or a sell, the second a date, the third a name of a share, the fourth the number of shares, the fifth the cost and, finally, the cost plus fees. After the shares in the portfolio have been displayed, three titles are given namely the total value, the total cost and the total fees paid. The second and third items in the menu are used when a purchase or sale is made and the entries, of course, update the datafiles. The fourth menu item is used when you wish to revalue your portfolio and it takes you through each share holding in turn, gives you the purchase price and invites you to enter the present price. The format if you choose the final menu option is similar to the first and lists your past buy or sell deals share by share. The amount of profit or loss is shown either as a positive or a negative figure. In summary this program is a rather nice, simple, straightforward share portfolio management program that gives you the essentials of what is required.

SHARE ANALYSIS — INVESTMENT ANALYSIS

Investment analysis is not easy. Even with a good calculator, long boring hours are spent in determining the necessary ''indicators'' of market action. Then graphs have to be drawn to get an extended view through time of what is going on. It is only then that the investigator can get an overall picture of which will enable him to make his decision. The purpose of this program is to allow the user to jump straight to the last step with a minimum of effort. All he is required to do is to type in certain data which the program records. It then calculates the indicators makes a ''symbolic chart'' and draws the graphs. The user may input data as frequently or infrequently as he wishes. This is kept in a datafile and is available at all times. A number of files are provided on the disk supplied. Most of them are datafiles, but the program entitled ''Analysis'' is the principal working program. The other datafiles are provided so that the raw data may be stored. This incidentally, when supplied contains demonstration data which are actual figures from the Financial Times. Another datafile contains the investment analysis indicators. These are automatically calculated and filed if new data is entered or after you have rewritten previous data. This file too, supplied, contains demonstration data. The third datafile holds a symbolic representation of the meaning of the interpretors in the terms of the probable Stock Market movements. It fills the screen with up arrows, down arrows and hyphens. The up arrows mean that those indicators show a tendency for the market to rise and, of course, the reverse for down arrows. Hyphens mean that no conclusions can be drawn from the indicators at that time. A final datafile is supplied which is a text file which gives an accountof how the data is ued to prepare the indicators and of how the indicators are used in previously marked analyses to imply market trends. It is this file that will give you the information that will enable you to examine the implications of the groups of indicators. The machine obviously requires the input of various indices such as the gilts index and the fixed index. These are obtained from whatever source you prefer. All in all a useful program which will obviously not guarantee you success on the Stock Exchange, but which should certainly be of some assistance.

MULTIPLE CHOICE QUESTIONS

This program is an extremely useful aid for the busy teacher and enables him to compile a series of multiple choice questions which can be saved to a disk file and also provides the student with the facilities to answer the paper after the teacher has written it. Various provisions are made for printing out and various other ancillary matters: The suite comprises two main programs. One is called MCQ and the other is called Question. The Question program is the one with which the teacher compiles his paper and the questions. MCQ, or anything else you may like to call it, is the actual paper. When this is run, the first display comprises some brief instructions, for instance, that you have to hit the ''T'' key for True, ''F'' for False and ''D'' for doubtful. You are also informed that a correct answer will yield the student one point, an incorrect answer loses the student one point and a doubtful answer is unmarked. Thereafter the machine asks whether the student or teacher requires a hard copy. Obviously the advantage of a hard copy is that the teacher can set a pupil to work on a file unattended. At the end he can return and have a permanent record of the pupil's performance. The next question posed is the subject required. This refers to the file name which the teacher gave to the particular subject when he made the file with the Question program. To further clarify this procedure the Question program is used by the teacher to make a file. MCQ is used by the student and the teacher so that that student can answer the questions. The file name mentioned is the actual paper set by the teacher with the Question program. When the correct subject is chosen, the program goes to the disk drive, selects the appropriate file and the question and answer session starts. The program will not accept any entries except those for True, False and Doubtful. After the questions have been answered, the machine will report on which were correct and the mark will be given for that question. Additional information given is the user's marks for all questions so far and the percentage mark. The same procedure is used for all questions. Eventually the machine will tell you that the paper is finished and the total marks and percentage will be reported. The Question program used to manufacture the papers, starts off by asking the teacher whether or not he is making a new file or adding to a previous one. If the former is chosen then the teacher must enter a file name, which is, of course, the subject matter of the paper. The teacher is then prompted to enter the first question together with prompts for each of the five possible answers. Finally, the machine prompts for a coded correct answer. When the teacher has his entire question in front of him and confirmed to the computer that it is correct, the material is transferred to a disk file, the teacher is asked whether or not there are more questions and so he proceeds throughout the paper. When he has finished, the file is closed off and is ready to be accessed by the MCQ program.

GAMMON CHALLENGER — BACKGAMMON WITH SOUND

Elsewhere in this list is described Back-40 which we distribute for Adventure International. Gammon Challenger is written by Ray Daly and Tom Throop. It is, we understand, a formidable program and although we have not played it against Back-40, we are told that it has already beaten the Backgammon issued by Hayden Publications and Instant Software. The human player plays against the computer and the game has three levels of skill. A useful feature is that an additional ''level'' is available. With this option the program plays with the skill of Level I which is the highest, but before each roll of dice, the machine enquires whether the human player wants to specify the roll. This feature can be very useful in studying the game. The player has the choice of deciding who plays first. The graphics are good. The dice are represented by graphic drawings of two cubes. The screen may be redrawn if it is erased accidentally. There are a number of additional and important features as follows:-

1. The board may be saved and recalled for later use. This function, of course, has a number of applications. Not only the obvious one of running out of time during a game, but also being able to save the game and compare it with others.
2. The board may be set up by the user, amongst other things so that the computer's response to given tests may be studied.
3. Sides may be changed so that the human player plays the computer's game and vice versa.
4. The level skill may be changed during the game.

All in all a very good Backgammon. We are not skilled Backgammon players, but if we had to compare this program and Back-40 we would be inclined to say that Back-40 probably has a very slight skill advantage, but Gammon Challenger has more user functions.

PILOT — THE EDUCATIONAL INTERPRETER

Pilot is probably the foremost language used by educationalists. This version of the language is written by Alec Wood of the Wirral Pilot Group and is a complete programming system for controlling interactive text, designed to make the creation of interactive computer assisted learning programs as straightforward as possible. As well as the interpreter the system also includes extensive edit and taping facilities allowing the ordinary subject teacher, or parent, to write the sort of user friendly text which is difficult to write with a general purpose language such as Basic. The Pilot language was first developed at the University of California and has been implemented on a variety of machines and on a number of versions. The Wirral Pilot distributed by us is available for both the TRS-80 and the Video Genie customers must state which when they order) and is an extensive integer subset of the common Pilot. Pilot is not a key word language like Basic, but instead uses single or double letter commands known as op-codes. A Pilot program consists of series of instructions, one to a line. Line numbers are not used. Each instruction is built up by adding conditioners and/or modifiers to the op-codes as required. The core op-codes provided in this Pilot are:

PR:	Set options	J:	Jump
R:	Remark	U:	Use Subroutine
T:	Type Text	E:	End Subroutine/Program
A:	Accept Input	C:	Compute

Only one modifier is provided which is J. It is used with the match op-code and causes the program to jump to the next match instruction if a successful match is not found. Five conditioners are available as follows:-

Y	Execute instruction only if the last match was successful
N	Execute instruction only if the last match was not successful
n	(n is a digit from 1 to 9) Execute if n matches the answer counter, for example, first time through an accept loop instruction 1 is executed, the next time instruction 2 etc.
E	Execute if the error flag is set
C	Execute if the last relational expression conditioner was true.

The program is accompanied by a 26 page manual which is both instructional and operative in content. The Wirral Group is anxious to have their interpreter as widely used as possible and its price reflects this desire.

SPACE EYE — TAKE THE PART OF THE BADDIE!

When you come to think of it, computer programs are rather like films, the viewer or operator normally takes the part of the good guy. In this game the roles are transposed. You take the part of a Vogon space commander and your mission is to destroy Earth, the Moon, Mars or Jupiter, before the surface defences shoot you down with their missiles. So far, apart from the roles being somewhat transposed, we have an ordinary space shooting game. The importance of this game is hinted at by its title - ''Space Eye'', for during the play of the game, that is to say during the attack on the planet, the centre of the screen is taken up by a fantastically realistic view of the planet underneath. Obviously the topography of Earth is better known to us than that of the other planets, so it is with the Earth attack that one gets the most realism. One almost gets the actual feeling of passing over the Earth as the Continents pass below the Space Eye. The impression is quite uncanny and really has to be seen to be appreciated. The graphics for the various planets are so extensive that they cannot be included in the program and are supplied in the form of datafiles which the program inputs. In other words, when you have chosen the planet which you wish to attack, the data for that particular planet is fed in from either tape or disk. Here and there on the planet's surface are enemy bases which have to be destroyed. Intermingled with them are the enemy's rocket sites which will, with uncanny accuracy, damage your vessel with their missiles. Although this shooting back and forth is good fun, the value of the program lays in the realism of the image of Earth passing beneath the Space Eye. As we are not so familiar with the other planets, the view passing beneath the Space Eye has been annotated with the names of the most important features and in the case of Jupiter and Mars, some of the Moons are displayed. During an attack the surface of the planet passes beneath the Space Eye as we have described, but an added feature is that the user has the option of displaying on the screen the planet over which he is orbiting. This can come in handy if you are not used to orbiting around Mars and Jupiter! Tape and disk versions are available.

PELMANISM — A COMPUTER VERSION OF THE CARD GAME

Essentially the object of the card game Pelmanism is for the player to remember the position of cards so that when a subsequent card is turned over he may match it. This computer version is a very good simulation of the original and essentially amounts to the same thing. When first started, the program displays the cards on the screen with the matter sides down. The player or players select cards from various positions which are displayed and the player must remember what they are. They are then covered up by the computer and another turn is taken. When the player thinks he can remember a match with a current turned up card, he calls for it and sees whether or not he is correct. The player with the most pairs at the end wins. Pelmanism is a simple game to play and is equally simple to describe. It is good fun, perhaps better for the younger members of the family, although an element of gambling may, of course, be introduced to make it more interesting for the adults!

TAROT — A NEW INTERESTING VERSION

We have previously stocked a Tarot. It was an early program and, to some extent, left things to be desired. On page 52 is described Yi-Ching, written by a Priest of Isis. Unlike some other programs, Yi-Ching was written in a serious vein as part of the work of the Centre of Maat. The same author has now written an entirely new Tarot which is being substituted for the old one. There are a great number of improvements. Indeed, we feel that it is not misleading anybody if we say that the previous version was in most senses a game, whereas this is a serious interpretation of the subject. An indication of the thought that has gone into the program is that when we suggested to the author that the cards should be dealt onto the table a little faster than in the preliminary version, we were told, in no uncertain terms, that the speed in the program was essentially the same speed as used by a person physically laying cards on the table and it should stay as it is! The program has been written so that it will be useful for both the person who considers Tarot as a ''fortune telling game'' and those, like the author, who work in the field and use it as a substitute for a pack of cards, any time and anywhere that they have a TRS-80 or a Video-Genie. The program has been used frequently to lay a reading for people who are not present or who wish an example reading and it has, so the author tells us, performed with a great deal of success. Part of the purpose of the program is to educate those who wish to learn the interpretation side of Tarot. A full course would apparently require 30 or 40 megabytes, but this 16K is a happy compromise. The layouts used are those which are used professionally and the Tarot cards and interpretations are based upon the Tarot of the Golden Chakra, which is a brother Centre to the Centre of Maat. Unlike the pure game versions of Tarot, no question is answered by the cards. The reason for this is two-fold. Firstly, that a general reading is given taking into consideration all aspects of a person rather than centering on just one and secondly, (bearing in mind that the author considers this a serious program) there are a number of subjects which the user should not be permitted to ask about, for instance, the subject of health. If as the author believes a person using the program should treat it with seriousness, a question about his health could cause worry and even harm to the questionner.

MODEL II

TRSDOS 2.0 A

Tandy have now issued the 2.0A version of TRSDOS for the Model II. Updates of previously issued programs are available. As some programs are being handled differently to others, we suggest that customers give us a ring if they want an update. Personally speaking, we have had so little trouble with the 1.2 (although 1.1 was a different story!) we wonder if it is worth all the trouble of changing over. Future software will of course go out compatible with 2.0A.

MAGIC WAND — A COMPREHENSIVE WORD PROCESSOR FOR CP/M

The Magic Wand word processor is now stocked for CP/M2 for the Model II. The disk operating system is described on page 61 of the catalogue. Magic Wand is written by Small Business Applications Incorporated and is said by them to be the most flexible, powerful and reliable word processing software available for the CP/M2. Obviously they are biased, but there is absolutely no doubt that the program is extremely good. It seems to include just about every word processing feature that one can think of and is accompanied by a very good 128 page User's Manual. It has been around for a while and so is, so far as we know, completely bug free. The Magic Wand has a particularly easy to use editor and uses only single stroke control keys to give commands. It takes advantage of special function keys wherever possible. In addition, you can set up library files with coded sections that you can merge by section name.
The Magic Wand allows you to set the left and the right top and bottom margins, page length, indentations, paragraph indentations, text left flush, right flush, justification two ways, literal or centred, variable line or pitch settings, variable spacing (including half lines), bold face, underlining (solid or broken), conditional hyphenation, sub and super scripting. An important point with these features is that each of the commands may be changed at RUN time when reformatting the file. External datafiles may be accessed with either fixed length or sequential records. Magic Wand converts the record into variables that you define and can use like any other variable. This data may be used for automatic formation letter generation. The user may define up to 128 variables with names of up to seven characters. The current value of a variable may be up to 55 characters and it may be printed out at any point in the text without affecting the current format. Although Magic Wand stores the variables as strings, the user may also treat them as integer numbers or format them with commas and a decimal point. Any print command may be given based on a RUN time test of a predefined condition. The conditional test uses a straightforward IF statement which allows the user to test any logical condition of a variable. In this way, you may skip over unwanted portions of the file, select specific records to print, or store more than one at a time in a single file. Magic Wand supports proportional print elements on the NEC, Diablo and Qume printers. Every formatting command, including justifying columns, bold face, underlining etc. are fully functional whilst using proportional logic.
Some of the features mentioned above will be dependent upon the printer used. We are sending Magic Wand out suitable for general purpose high quality printers, but they can be sculpted to suit most of the well known printers. Word processors are extremely hard to describe in sales literature because essentially their strength depends on the number of commands that they have and it is just physically impossible with a versatile program such as Magic Wand to describe them all.
To give a rough indication, the standard format Magic Wand for the TRS-80 Model II, you can use all 23 control keys and it has approximately 120 edit commands.

Hints and Tips May 1981

As has been mentioned elsewhere in this listing, we have now moved premises to 1 Buckhurst Road, Bexhill on Sea. To say the least this was both a traumatic and physical upheaval. It took place over a period of a number of weeks. The reason that I am reciting these facts now is because they constitute my excuse for a rather brief Hints and Tips column this month. The first point is not really a Hint or a Tip, but we are getting a large number of enquiries from prospective authors asking how many copies of their program are likely to be sold and how much royalty they can expect to receive therefrom. Obviously we are not able to report on the actual royalties paid to specific authors, but what we can do, and it may be of use to prospective authors, is to say that on the last quarter the least amount in royalties that were paid to any one author was £1.79 and the highest was a fraction under £1,000.00. It will be seen, therefore, that over this three month period there was a vast difference in royalties paid. This is normal and is the reason that we cannot give any definite indication when asked. We receive a number of criticisms regarding the Video Genie manuals. Personally, I have never thought that they were particularly bad, but two rather important points are missed out. The first is that they make no mention of when one should type in the memory size reservation, in other words, the last address which Basic can access. On a TRS-80 it comes up on the screen as ''MEMORY SIZE?'' or ''MEMSIZE?''. The point at which it should be entered with the Video Genie is on the first question ''READY?''. The number is simply entered and as usual the display will clear and a second ''READY'' is shown at the bottom of the screen. The second point not covered by the manuals is the use of the graphic codes which are displayed on the screen by the command CHR$(nn), when nn represents the character code in question. Any Video Genie owners who would like a copy of the appropriate codes and the graphic symbols can get it from us free of charge. It is quite often useful to remember that a file name used under the SYSTEM command can be abbreviated to the first letter. In other words, if the normal file name is ''TEST'', then all of the following entries will be recognised — T, TE, TES, TEST. For some reason we do not seem to have mentioned before that a few months ago we published a booklet entitled ''Using Cassette Tapes with the TRS-80 and the Video Genie''. This is really an accumulation of personal experiences with this vexacious subject. It has been found to be of use to some customers and anybody who would like to have a copy need only send us a stamped addressed envelope or request it with an order. We will see if we can get into some rather more useful Hints and Tips next month.

July Listing

The 4th Personal Computer World Show

WE ARE AT STANDS B24 & B25 UPSTAIRS.

12-15th September, Cunard Hotel, Hammersmith, London W.6.

We still have a few Complimentary Tickets left for regular customers.

ASTEROIDS — A FUN ARCADE GAME

For some considerable time now the game of Invaders has ruled the arcade games market and it is probably the most popular game that we have ever sold. Now, however, we are going to market with Asteroids, which, like Invaders, stemmed originally from the arcades. For those of you not familiar with the game, the idea is that you take the place of a space ship which encounters showers of asteroids. You have to dodge them and annihilate them with you ray guns. The problem is every time you hit one with your laser beam it splits up into a number of others, all of which are potentially fatal to your craft. When an asteroid hits you the craft is destroyed and one life is taken from your score. This particular version has a number of enhancements. As normal, you can rotate the ship around its axis so as to fire in different directions. You can also supply thrust to your space ship so that it moves forward. An additional feature of this game is the provision of hyperspace movement. This causes a move of the space ship to a random position which, of course, is very disconcerting for the asteroids. Score is 100 points for a small asteroid, 50 for a medium size, and 20 for a large. This seemingly illogical rate is, of course, due to the fact that a smaller asteroid is harder to hit than a bigger one. In addition to the asteroids, some fast moving alien ships will cross your path from time to time. These are pretty murderous beasts because they are firing off rays in all directions and, of course, if they hit your ship then you lose a life. One of the great advantages (as with our version of Invaders) in this version of Asteroids over others that we have seen, is that the game parameters can be changed. The player has control over the speed of the game, the initial number of asteroids, the increase in asteroids per frame and the starting number of lives that the player has. The program is written in machine code, of course, is fast moving and enjoyable. Personally we prefer it to Invaders, but everybody to his own taste. Very nice sound effects are included in the program. Available on tape and disk.

the game is played) which may be dangerous. If possible, the player should jump over them. However, sometimes they are particularly dangerous and landing on them can be fatal. It is a game of suspense, skill and strategy for 2, 3 or 4 players of all ages. The skill comes in because at the centre of the map is a flashing area which indicates the level of danger at the marshy sites. If it is flashing slowly it is safe to land, but the faster it flashes the more risk such a move causes. Indeed, if you land on one of these spots when the flashing is at its fastest then it is almost inevitable that the player will sink into the quagmire and his piece (of which, incidentally, he has four) will be lost from the game. The flashing serves a further purpose. To determine the direction of your move, the player must press one of the keys N, S, E, or W. If the key is pressed whilst the flashing block is illuminated, the move will be for two spaces, otherwise for one. This additional space can be very important because it allows the player to make rapid progress across the marsh and (often more importantly) to leap over the danger spots. This is where the element of skill enters the game, especially if the patch is flashing rapidly and danger is at its highest. Keying at the wrong time can land you straight into a danger spot. It is hard to categorise this game. It is most enjoyable and although we have never played the original, we would think that this computerised version has a large number of advantages. We imagine that in some respects it is similar to a "de-luxe" version of Snakes and Ladders, but it seems to have an appeal all of its own. The competitive ingredient is very high. In other words, a fun game.

LUNAR LANDER — A DIFFERENT LANDING

We already carry what one might call the "normal" Lunar Lander, that is to say, the one where the game is played by balancing correctly the various statistics of landing such as fuel, descent velocity and thrust. This new Lunar Lander is somewhat different. It is very heavily orientated towards graphics which are extremely good. The only parameters one has to worry about are a left and right thrust and fuel. The player is presented with a lunar lander some distance above the lunar landscape and he must manouevre it to one of 10 safe landing sites. All of these carry different points allocations. If you make a successful landing then the appropriate points are awarded, otherwise you crash and start again. Some of the sites are extremely hard to get into. Indeed there is one expert one which awards 900 points. The program is written in machine code. For us it has one deficiency, namely that it uses the Dry Reed switch as a source of noise for a crash. We have never particularly liked this move as we feel it doesn't do the switch very much good. However this may be, a number of people use the technique so there we are. Available on tape or disk.

BASIC COMPLIER — AT AN ECONOMIC PRICE

The functions of a Basic compiler are described on page 35. Briefly, and by far an over-simplification, a compiler takes an ordinary Basic program written under the ordinary interpreter in the TRS-80 or the Genie and converts it into machine language, the purpose being, of course, to attain greater speed. We already stock a number of Basic compilers. They are all from Microsoft and they are all full compilers, that is to say, they take every Basic statement and compile it into equivalent machine code. This is then directly executed under DOS. Because they compile everything they have quite a large run time memory overhead (although it is far less than it used to be) and because they are extensive they are also costly. We are now stocking the ACCEL and ACCEL2 from Southern Software. These sell at a fraction of the price of the Microsoft. The other good news is that they also compile to tape and no royalties are payable if the compiled program is resold, but the bad news is that they are not full compilers, nor, in the case of the disk version, do they directly execute from TRSDOS. However, when you compare the prices, you may feel that the trade off is a worthwhile one. Another big plus is that the ACCELs will compile existing Basic programs so long as they are syntactically correct. We mentioned that the ACCEL is a partial compiler. What is meant by this is that some Basic statements are not compiled at all, they remain in their original Basic source form and are executed as such. These include, but are not restricted to, PRINT statements. This means, of course, that the eventual speed is not as high as the Microsoft Basic Compiler, but it is, of course, a great deal faster than ordinary Basic. It is impossible to give any firm figures on speed comparisons because it depends what the machine is doing, but it is fair to say that as everything is compiled, the Microsoft Compiler would be somewhat faster than the ACCELs but in some applications this is hardly noticeable. The ACCEL2 is an improvement over the plain ACCEL in that string and single and double precision operations are optimised, not just integer operations. ACCEL is used with ordinary Level II Basic or the Video Genie Basic, ACCEL2 is used for Disk Basic and will, of course, save and load compiled programs to or from disk. Both are available on tape and ACCEL2 is also available on disk. When used with tape it is necessary to have a subsidiary program which will save code to the tape. TSAVE is written for this purpose and is described elsewhere in the list. Hence it is recommended, but probably other programs such as System Savers (but not Copsys) and the monitors would carry out the same chore.

TSAVE — A MEMORY DUMPING PROGRAM

We already carry a number of programs which will carry out this task of dumping sections of memory to tape. TSAVE, from Southern Software, however, was written specifically for use with their Basic Compiler listed elsewhere and we are therefore stocking it. The operation of TSAVE is that the user enters in as many ranges of memory as he wishes and then a start address. Entries may be made in either decimal or hexadecimal and indirect addressing is permitted. Once the ranges and the start have been specified the program enters a simple "command" mode which permits the entry of three commands, either R for Record, C for Check or Q for Quit. A particularly feature is that the letters can be entered as many times as you wish which will result in multiple records or checks of the same section or sections of memory. It can be seen, therefore, that any number of ranges of addresses can be saved on to the same tape and any number of copies of those ranges can be made.

RANDOM DUNGEON GENERATOR — A FANTASY GAME COMPILER

Random Dungeon Generator is a game aid for umpires controlling conventional "paper and dice" fantasy role playing games such as Dungeons and Dragons, Chivalry and Sorcery, Runequest, Empire of the Petal Throne etc. Those who have tried these as well as computer Adventure games will be in no doubt that the "paper and dice" games offer far greater flexibility and variety of play, plus all-important continuity. Their main disadvantage, however, is that the umpire must spend long hours designing and preparing the "dungeons" that the players will explore. At last, however, for users of the TRS-80 and Video Genie, this problem has been solved. Random Dungeon Generator is a suite of three 16K programs which allow the user to generate to his own specifications of size and shape any sort of human or non-human habitation, temple, palace, prison, tomb etc. The first program designs the floor plans of the "dungeon" complex. The user specifies the number of levels, how many are above and below ground, and the size and shape of each level. The program does the rest. The second program selects the contents of each room in the complex. The user chooses the function of each level of the complex — noble living quarters, servants' quarters, palace, temple, tomb, prison or lair. He selects whether the principal occupants will be warriors, sorcerers, priests, thieves, elves, dwarves or one of the other non-human races. He can give any name he likes to the whole complex and to the owner of the complex. Thus the program can generate a sorcerer's tower, a mighty temple, a dark and dusty tomb, a bandit hideout, a lord's castle, a royal palace, a noble mansion, a lofty pyramid, a goblin cave warren, or whatever the user's imagination can encompass. The encoded complex is then dumped on tape for permanent storage. The third program decodes the complex, displaying the floor plans on screen, showing the rooms, corridors, doors and secret doors, stairs and trapdoors. The user selects the floor level and room number he wishes to examine, and a full report on the contents of the room is displayed, including room function, furniture, decor etc., occupants, monsters, traps and treasure. If a sorcerer or priest is encountered, a full list of the spells he has available is displayed. It is then up to the players to decide their actions, and the umpire to adjudicate the results, according to the set of rules he is using. Random Dungeon Generator has been designed so that it can easily be customised by the user to fit the exact details of the particular set of rules he is using. All monsters, spells etc. have been placed in DATA lists in the decoder program, so that they can easily be replaced, if inappropriate, by monsters, spells etc. which better fit the rules used. Full instructions for modifying the programs are given in the documentation. Note that Random Dungeon Generator is not a complete game in itself and must be used in conjunction with one of the sets of rules mentioned above, or any similar rules. "DUNGEONS & DRAGONS" is the registered trade mark of TSR Hobbies Inc.

KFS-80 — A KEYED FILE SYSTEM

The Keyed File System allows rapid access to DOS records and, specifically, files, by means of a key. It uses an Index Sequential Access method whereby the files are organised in a tree structure which minimises disk accesses to specific records, thus file entries may be accessed by means of a specific key. The keys may be inserted anywhere into a record.

TREASURE TROVE — SEARCH THE DUNGEONS FOR TREASURE

Treasure Trove is a type of adventure game (note the small 'a') which can be played by 1-3 players. Although it is quite a familiar theme in that the player or players must search dungeons and corridors for treasure, this program does have a lot to recommend it. The dungeon is made up of blocks of 100 cells of four levels, each, of course, being 5' × 5'. The instructions include two sample play sheets, the first is made up of a map of one level and the second a map of all four levels. Thus the player can map his progress as he goes. The winner, of course, is the first person to retrieve a set amount of treasure and get out alive. Play begins at the centre cell of the top level and each player may explore in the direction of either of the four compass points from this entrance. Whenever a player moves to a new cell it will be displayed on the screen along with its location and whether there are stairs leading up or down. These cells are of two types, chambers and corridors. The former contain more treasure than do the latter. Also, corridors are always safe, but chambers may contain monsters or traps. Some doors are secret and allow movement in one direction only. Some stairs are the same. This latter provision can be a bit tricky because if you do not watch out, you can go down a ''down only'' staircase and have a lot of problems getting back up. Any time you find yourself in a chamber with a monster you are in a combat situation. You will be told the monster's strength and it is for you to decide whether to attack or attempt to retreat. If you choose the former, you will enter one round of combat from which your chance of success will depend on your strength as does the monster's. After combat you will probably have lost some strength as may have done the monster, but if you are both still alive you will again be given the chance of attacking or retreating. Combat continues in this manner until one of you dies or you retreat. If the player is successful he may find some treasure to be picked up. A retreat is not always successful, but perhaps it would be better to keep some of the more intricate parts of the game a secret until it is played! Strength is a measure not only of the player's ability to fight, but also the weight that he can carry. A number of factors can reduce this strength. Obviously losing a combat round would, but also carrying treasure saps your strength as does retreating. The closer the weight you are carrying gets to your strength, the more likely you are to lose a strength point when moving. Treasure may be banked throughout the game so as to lessen the load. There are six magic items which may be found ranging from magic shields, swords and carpets to strength potions, moon dust and lucky charms. Finally the good news — all is not lost if you are killed. Treasure Trove is a three generation game, that is to say, if you get clobbered your son inherits your treasure and may continue the family quest. This program, as supplied, is compatible with disk Basic and a customer can transfer it if he wishes. However, a disk Basic version is available and as it has one or two slight improvements, customers would be better advised to purchase it.

SERPENT — AN UNDERWATER HUNT

This is a unique game. Essentially it is a shooting game, but its prime appeal is that it takes place underwater and the battle is between submarines, serpents and whales, very big whales we might add. The player is in command of the submarine and can fire torpedos with which he must hit large sea serpents that are wriggling all over the place. When he does he may either kill the serpent, in which case it sinks to the bottom of the sea, or he may split the serpent into two rather like cutting a worm in half, and he will double his problems. The decisive factor is whether the torpedo hits the first three sections of the serpent or otherwise. If the serpent collides with the submarine it is sufficiently big to damage it and the submarine can only survive five collisions. The whale must be extraordinarily large because it is several times the size of the submarine, and if it hits the submarine then unfortunately the submarine sinks to the bottom and the game is over. One of the great attractions of the game is that it can be set to almost any speed and skill level required. There are five pre-set speeds, but the sixth is a ''special mission'' in which all of the following parameters can be set up: overall game speed, submarine speed, torpedo speed, number of torpedos in the salvo and serpents' speed. In other words it is pretty well possible to sculpture any grade of game that one wants. Score, of course, is kept of how well you are doing which will introduce competitive spirit with more than one player. All in all, quite a bit of fun and it certainly makes a change from zapping space ships. Written in machine code. Available on tape or disk.

DESCRIPTIVE STATISTICS PLUS CENTILES — EASY TO USE PROGRAMS

Many statistical programs suffer from being over complex. One of the chief advantages of this one is that it is extremely easy to use. It is effectively a composite program being made up of three parts. The first calculates an extensive range of descriptive statistics. The second illustrates a sample distribution with Histograms and a table of Centiles. The third creates a cassette data file of the univariate data. The program is designed to be used by those with no experience in computing and also all non-statisticians. Prompts and instructions are included throughout the program. Input to the program may be entered in three ways: from the keyboard, as data statements or from the cassette data file created by the program. After the data has been input in one of these ways the Descriptive Statistics section of the program will calculate the following.

Sample Mean	Skewness	Variance (Unbiased)
Standard Deviation (Unbiased)	Minimum Value	Variance (Biased)
Standard Deviation (Biased)	Sum X	Kurtosis
Standard Error	Number of Values	Maximum Value
		Sum X Squared

The second part of the program is the Centiles (some people call them Percentiles) and Histogram section. The program has been written to allow the user to view the distribution of the values at high and low resolution Histograms to check if the data appears normally distributed. For non-normal data a sample distribution can be analysed without assumptions of normality by generating a table of Centiles. The confidence limits of the Centiles are also calculated. So far as is known it is the only commercially available program which calculates Centiles and their confidence limits. Hence this section of the program calculates the Centiles of a sample and 95% confidence limits of the Centiles. The sample distribution is illustrated with a Histogram with 50 groups, a Histogram with 10 groups and cumulative frequency (%) distribution. The final section of the program enables the user to create a permanent data file on cassette and six options are available therewith, namely to create a data file, to check it, to change an entry on the data file, to delete an entry, to extend the data file and, finally, to copy it. The programs have been written so as to accommodate virtually unlimited sample size, although, of course, in practice the size of the data file will be restricted to a practical size of cassette.

IMPORTANT — IMPORTANT — IMPORTANT

As you can see, we are now starting a new format for the Index. Apart from the fact that this is now kept on the computer, you will see that there is now a new column which denotes the machine upon which the software will run. It is most important that if you are not ordering for a TRS-80 Model I or a Video Genie, Model I or Model II, you must so indicate on your order. Where a tape or a disk is compatible with both the Model I and the Model III TRS-80, it is supplied in Model I format, that is to say, at 500 baud for the tape and single density for the disk, it being left to the user to transfer it if he so wishes. Model III only programs will be sent out at 1500 baud and double density.
The above new policy means that from now on there will be no separate sections for different models of a machine. To further clarify, fro this page onwards it is necessary to look in the Index to see the machines for which the item of software is compatible.

FOREST OF MORDOR — WATCH THOSE DWARVES

Although this program bears some relation to maze software, it is made far more interesting by the inclusion of rather weird and wonderful things. The game is played on a board which comes up on the VDU. It is essentially an outlined square with various letters, numbers and graphic symbols randomly spread over it. The object of the exercise is to get from the starting point to the exit without being overcome by the many obstacles put in your way. These are Trolls, Dwarves, Orcs, Treorcs, Gormaz and, from time to time, Seredic the Magician. Treorcs are sleeping Orcs and do not move, but colliding with them will mean that you will be eaten. Mysterious forces do occasionally awaken them. Dwarves are slow moving, but extremely ferocious. Unfortunately they have rather one track minds because whenever they encounter each other they mate and produce the dreaded Orc. Trolls are rather like fast dwarves, but are constantly at war with the dwarves so they will destroy each other if they meet. Orcs are probably the biggest problem because they eat anything in their path and gain power thereby, hence they can move more and more quickly. The Men of Murduin are long time enemies of the Orcs and are constantly hunting them. If you are lucky, therefore, the odd Orc will be killed by the mens' arrows. Seredic is a magician and when he appears you may optionally sample his powers. If you receive an elf clock you will become invisible for three moves, for instance. You can light flares from time to time which have the effect of stunning the creatures temporarily and enabling you to move. The player is armed with some arrows which when shot will destroy the first thing that they reach. Occasionally an army of Gormaz will pass through the forest and they destroy everything in their path. So, as you can see, the trip through the forest is one fraught with danger. The player starts out with 1000 points, each move costs 5 and there are various other penalties. The game is, as we said at the beginning, made more interesting by the scenario which converts a moderately interesting maze game into a game which has considerable appeal. The program is compatible with disk Basic.

ELEMENTAL MAZE — A PLEASANT WAY TO LEARN

This is an interesting program aimed at pupils in the latter years of C.S.E. or 'O' Level courses, the first year of an 'A' Level course, and, of course, their teachers. The player is presented with a maze on the screen. The maze is made up of black and white squares. You are not allowed to pass through the white ones and when you arrive at a black one you will be given a clue as to the name of an element, such as Manganese or Nickel (that is the element, not the clue). Each move costs the player 10 points, but 15 may be gained by identifying the element described correctly. Identification of an element is only available on the first visit to a square and the player starts with 500 points. Each time the maze is entered or the game run, the elements are re-shuffled. A list of all the elements is included in the instructions and a list of those actually used in the maze is available from the screen. An example of a clue given is "A metal whose Chloride or Nitrate is used to test for Sulphates". A useful educational program which we are sure will make the learning of the elements more easy. Elemental Maze features sound.

MODEL III ROM COMMENTED

In order to make use of ROM in machine code programs and as USR calls in Basic programs, it is necessary to note how the gigantic pile of spaghetti sitting there in the computer is linked up. Sorting all those strands out is a enormous task. It was carried out with the Model I ROM and the fruits of that exercise were listed in an extremely popular book "Microsoft Basic Decoded" described on page 55 of the catalogue. It was some two years after the Model I was introduced that the book was published and we are pleased to be able to announce that it has only taken a fraction of that time for a similar book regarding the Model III to come into existence. "Model III ROM Commented" is published by Soft Sector Marketing of the United States and, like the Model I book, it goes through every address of the Model III ROM and comments thereon so it is a comparatively easy exercise to unravel the code. Shown below (split into two for space reasons) is a typical page of the book. As can be seen, the information is split into three columns, the first being the address, the second containing the Mnemonic Op-Code and Operand and the third, the comments. Again. like the Model I book, for copyright reasons the actual hexadecimal coding contained in the address is omitted and, if required, it will have to be added by the user by way of a Disassembler.

For people who have the Model I book we should mention that the Model III one does not contain any information in excess of the decoding of the ROM, with the exception of some comments on RAM usage between 4000 and 4224. These are not commented continuously, but are restricted to certain areas. We thought we should mention this because the Model I book did contain a page or two on various unrelated topics. The area of ROM commented, incidentally, is from 0000 to 37FE. We found the comments to be extremely useful and perhaps a little more explicit than the Model I book and there are very few gaps in the code.

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```
3642    DJNZ 363FH        LOOP UNTIL DONE
3644    LD HL,41E8H       CLEAR INPUT OPTIONS
3647    LD B,3            3 BYTES
3649    LD (HL),0         CLEAR BYTE
364B    INC HL            NEXT BYTE
364C    DJNZ 3649H        LOOP UNTIL DONE
364E    LD HL,41F0H       CLEAR OUTPUT OPTIONS
3651    LD B,3            3 BYTES
3653    LD (HL),0         CLEAR BYTES
3655    INC HL            NEXT BYTE
3656    DJNZ 3653H        LOOP UNTIL DONE
3657    JR 3636H          RETURN

        RS-232 INPUT ROUTINE
365A    LD IX,41E5H       IX=> DCB FOR RS-232 INPUT
365E    XOR A             CLEAR INPUT
365F    LD (IX+3),A       CLEAR BUFFER
3662    BIT 2,(IX+4)      RS-232 ACTIVE?
3666    RET Z             RETURN IF NOT
3667    IN A,(0EAH)       GET     BIT 1,(IX+4)      WAIT
3671    RET Z             RETURN IF NOT.
3672    CALL 028DH        CHECK <BREAK>.
3675    JR Z,3667H        WAIT IF NOT PRESSED.
3677    JP 4203H          EXIT IF PRESSED.
367A    IN A,(0EBH)       GET DATA
367C    LD (IX+03),A      SAVE IN BUFFER
367F    RET               DONE

        RS-232 OUTPUT ROUTINE
3680    LD IX,41EDH       IX => DCB FOR RS-232 OUTPUT
3684    BIT 2,(IX+4)      RS-232 ACTIVE?
2688    RET Z             RETURN IF NOT
3689    IN A,(0EAH)       GET STATUS
368B    BIT 6,A           READY TO SEND?
368D    JR NZ,369CH       SKIP IF SO.
368F    BIT I,(IX+4)      WAIT?
3693    RET Z             RETURN IF NOT
3694    CALL 028DH        CHECK <BREAK>
3697    JR Z,3689H        WAIT IF NOT PRESSED
3699    JP 4203H          EXIT IF PRESSED
369C    LD A,(IX+3)       GET BUFFER CHAR.
369F    OR A              NULL?
36A0    JR NZ,36A3H       SKIP IF CHAR IN BUFFER.
36A2    LD A,C            GET CHAR FROM DISPATCHER
36A3    OUT (0EBH),A      SEND CHAR.
36A5    LD (IX+3),0       ZERO BUFFER
36A9    RET               DONE
36AA    INITIAL VECTORS AND DCBS FOR
        RAM 4000H-404BH. TAPE & DISK
36F5    00 00 00 00       UNUSED

36F9    INITIAL VECTORS AND DCBS FOR
        RAM 41E5H-4224H  TAPE & DISK.

        I/O RE-ROUTER
3739    LD A,(IX+3)       GET 1ST CHARACTER OF DESTINATION.
373C    CP 52H            IS IT A "R"?
```

BLACKBOARD — MAKE YOUR COMPUTER A DISPLAY TOOL

This program generates letters which are about 1" high and so are very easily seen. The screen format is 6 lines of 21 characters. The maximum length of the display is 480 characters including control characters. All letters and numbers may be shown, together with comma, space and full stop. The program is very nicely written, resulting in an easy to use piece of software. The page is composed without any difficulties and the commands available are almost always shown on the screen. The composed message may be stored on tape and, of course, loaded therefrom. When actually composing the message, the user types onto a simulation of the screen, thus making it very easy to compose messages with considerable visual impact. The display of the message, of course, is continuous. Rather a nice touch is that the letters are displayed as they are normally written, in other words, there is a very slight delay as the letter is printed giving the appearance of writing; a letter does not suddenly appear on the screen. The writing speed has been chosen carefully to provoke maximum curiosity from the person looking at the display. It is therefore ideal for window displays, parties, discos, etc.

WONDERLAND — A SEQUEL TO THE FAIRYTALE ADVENTURE

In the last list we published a new Adventure called Fairytale which was written in Basic. The author has now written a sequel to it. In the earlier description (page 32 of the catalogue) we discussed the merits and otherwise of Basic Adventures so we will not go through that again. Wonderland follows Fairytale in content in that it is aimed at family participation. Again fairytales and nursery rhymes are used, indeed about 10 stories or rhymes are referenced, together with Mickey Mouse, Tom and Jerry, and so on. Such a subject may deter some customers from buying these programs, although the reaction to the first one has been positive. We would suggest that customers try to get over their inbuilt manly discrimination against fairytales and wonderlands and have a go at these programs. They are surprisingly good fun. After all, it isn't very often that you get the chance of playing croquet with a flamingo on a computer!

SHOWDOWN — A GRAPHIC GUN-FIGHT

This is a graphic game for 1 or 2 players which features good graphics and sound. Each player has control of a graphic "man" (in the case of one player, that is to say playing against the computer, then the computer controls one of the men) whose arm can be raised and lowered. In addition, the man himself can be taken up and down one side of the screen. Both gun-fighters have a six-shooter which, incidentally, unlike some films, are restricted to six shots — you have to have a re-load period after they are gone — and the idea, of course, is to shoot each other. It is nice and simple. The only complications are some wagons and cactii which come between the gun-fighters from time to time. A nice harmless game, the biggest feature of which are the graphics. It is available on tape or disk.

MACES AND MAGIC — BALROG

Before we forget to mention it, this program requires a two Drive system. Maces and Magic are fantasy Adventures of a type which are becoming rapidly commonplace. Balrog revolves around a dungeon, although there is quite a lot of work before you can find it. In the dungeon there are various monsters, traps, enchantments and illusions set by nefarious dungeon masters and, of course, if you get through it all you escape with riches and glory. Before you start off on your journey you are well advised to choose from the "Store" weapons and armour. There are an amazing number of weapons, 80 in number; all of them vary in their power, weight, cost, dexterity and other factors. The armour differs in weight, cost and the approximate number of hits it can sustain. As mentioned, the program requires two disk Drives to run. This is because of the really amazing amount of data. As normally supplied, the disks are 35 track and there is no space left on one and only five granules on the other. The program makes fairly frequent trips to the Drives for data and this does tend to slow it down to some extent, but not sufficiently, we feel, to put the player off. Your character attributes are chosen at the beginning of the game randomly and consist of strength, intelligence, luck, constitution, dexterity and charisma. The dungeon itself is stable in three dimensional space, that is to say if you leave a room by the north door and turn south you will return to the same room. Sometimes you will be involved in battle and if this occurs, five exchanges of blows will pass before you get a breathing spell. There are eight commands you can use as you travel: To get an item or pick it up; to leave an item; take an item out of your pack; help, which lists these commands on the VDU; a status report to give you all prime information about yourself; a wait command which enables you to recuperate from a battle or whatever; an inventory command, and finally, a command to save the game. One or two comments on playing the game. The Inkey function is used almost throughout, but the Cursor does not appear, so until we realised that the Inkey was used widely we were hitting the Enter key by mistake. This did not, however, seem to have any bad effect. Occasionally, particularly when one is out in the countryside, some of the questions are rather enigmatic, leaving the player in some doubt as to what he should do. The solution always seemed to be to type a command which would have been relevant to the previous prompt. Neither of these preceding points are at all important, but one thing that should be mentioned is that the Break key is not disabled, hence it is possible to break the run whilst files are open. The player should always remember, therefore, that if he exits from the Break key he must type CLOSE. Available on disk only.

POKER — TEST YOUR SKILL AGAINST THE COMPUTER

If you have never played a Poker tournament with The Kid, Tex, Slim, Bart and Doc (and who has) this program will enable you to do so. There is not too much to say about it because it is simply a tournament of Poker in which you play five people controlled by the computer. The program starts with a simple drawing of a table with six positions of which the player occupies one. Everybody starts off with $1000 and the ante is $20 into the pot. The human player instructs the computer to deal when he is ready and then he is asked for his bet. The other players in turn decide whether to See, Raise or Fold. Assuming that a computer player is left at the table, in other words, they have not all folded, the human player is asked for his decision. There is another run of betting and then each computer hand discards and picks up whatever is decided and the human player is asked how many cards he would like to discard. The cards are replaced and the ranking of the hands decided, whereupon the winner is declared, his stake increased and another game started. It seems to be a simple and adequate representation of the game. It is a pity that there is no further betting after the first couple of rounds, but presumably this would take it beyond the 16K capacity of the machine.

77/80 TRACK DRIVES

As 77/80 track Drives become more widely used, an incompatibility between them and normal 5¼" disks has manifested itself. Without going into details, this problem arises because both the hardware and the media are really being used to their utmost limits. The symptom is a difficulty in formatting or backup. It will happen on an intermittent basis, that is to say, sometimes it will occur and sometimes it will not. As obviously the hardware, that is to say the Drive, cannot be modified, we have arranged to stock a different type of disk which you will find listed in the Index. These are guaranteed for 77 track use.

BASIC COMPILER — FOR THE MODEL II

The Microsoft Basic Compiler for the Model I is described elsewhere in the catalogue. This is now available for the Model II. It contains all of the advantages of the Model I version so it is not necessary to give further description at this time. In view of comments elsewhere in this listing (relevant to the Snapp Convert program) we should emphasise that like the Model I version, the Model II enables the compilation of existing programs running under the Microsoft interpreter in the Model II machine.

SNAPP INC.

Snapp Inc. have introduced a large quantity of new utilities for the Model I, II and III TRS-80 machines. The only one for the Model I is Structured Basic and this should also be compatible with the Video Genie providing it is a disk system. It is uncertain at the time of going to press whether Snapp support their Model I software for the Video Genie. Before this list is circulated we will have done some tests, so any customer with a Video Genie disk system who wishes to operate Structured Basic should contact us before ordering or should send in their order subject to it being compatible. We should also take this opportunity of repeating that with all Model II Snapp disks is given away a program called DOSFIX which carries out certain patches to the DOS itself. This is described at the bottom of page 44. Although as mentioned elsewhere in this list our new system is to stipulate in the Index the machines for which particular items of software are applicable, we should mention that with the exception of SBASIC for the Model I, the Spooler and Extended Basic for the Model III, all of the following programs from Snapp are for the Model II.

SBASIC — A STRUCTURED BASIC PRE-PROCESSOR

Programming in normal Microsoft interpretive Basic, that is to say, the Basic supplied with all of the TRS-80 and Genie machines, does not lend itself easily to the production of Structured Basic programs. Even the best programmer tends to finish up with a pile of spaghetti containing GOTOs, GOSUBs etc. to a greater or lesser extent. Nonetheless the Structured program is a highly desirable aim for it is far more efficient in terms of execution, program control and readability. It is often hard to come back to a program, even one which one has written, after a few months and immediately make sense of it. A Structured program is far easier to return to. The purpose of this program, SBASIC, is to make the production of disk programs of a highly structured nature more easy. SBASIC pre-processes the program after it has been written and therefore enables the inclusion of many additional statements. To enhance the four basic control statements presently available, GOSUB, IF, GOTO and FOR/NEXT, the additional features are divided into four categories, Decision Structures, Loop Structures, Case Structures and Procedure Definition and Use Structures. The actual additional statements available are as follows:

Decision Structures	Loop Structures		Case Structures	Procedure Definition and Use Structures
IF/FIN	FOR/FIN	REPEAT UNTIL/FIN	CONDITIONAL/FIN	PROCEDURE/FIN
UNLESS/FIN	UNTIL/FIN	REPEAT WHILE/FIN	SELECT/FIN	PERFORM
WHEN/FIN ELSE/FIN	WHILE/FIN			SET ERROR TO

The three statements in the Decision Structure category help the programmer to untangle the mess that one sometimes gets into using only the standard IF statement. They enable the programmer to write exactly what he means without resorting to GOTOs or THENs to implement it.

''Normal'' Basic provides only one Loop Structure, namely the FOR Loop. This is restrictive in that one can only construct a loop which repeats itself incrementally changing the value of some variable until a specified limit is reached. SBASIC provides five Loop Structures as listed above.

Basic provides only one Case Structure, the computed GOTO/GOSUB. This statement is frequently hard to modify and rarely clear. SBASIC provides a reserve word CONDITIONAL to indicate a Case Structure. Inside of this structure there are SELECTs which effectively do the equivalent of an IF. If the SELECT test is true the statements inside the SELECT structure are executed. After the statements are executed control is passed to the end of the ADDITIONAL structure. An optional catch-all clause is provided for under the reserved name OTHERWISE. In the case that none of the SELECT's are true, the OTHERWISE clause will be executed. Only one clause will be executed inside the CONDITIONAL structure.

The Procedure Definition is an easy way to write in-line subroutines. These are similar to programming in COBOL. The code placed in a paragraph is ''labelled'' with the reserved word PERFORM followed by the procedure name. The procedure is executed and then control continues from the statement following the procedure call.

In summary, SBASIC makes top-down programming very easy. It is not a particularly easy program to describe in a catalogue however! The programming task can be broken down into several general procedures first and then each may be coped with in turn. A further advantage of using SBASIC is that logical errors are very easy to spot, indeed such errors should be lessened by using SBASIC as the very act of doing so tends to eliminate them. The other side of the SBASIC coin is that it requires about 10K of memory on top of the interpreter.

PL/B — PROGRAMMING LANGUAGE/BASIC

In some ways this is similar to SBASIC described above (although that is for the Model I and this program is for the Model II). The principal similarity is the aim of the software which is to produce structured programs, the advantages of which have been described above. What has been done is to select the most powerful logical components from Basic and merge them with the power of the language PL/I. This has resulted in an unbeatable structured program facility which can increase programmers productivity up to 50%. PL/B is fully integrated into the Basic interpreter and two modes of operation are available, that is to say, Transparent or Compile and Save mode. PL/B is in effect a hybrid language which retains all the best functions of Basic and merges them with the control structures from the PL/I language. PL/B is a line independent language. Line numbers in a PL/B program have absolutely no meaning and exist only because the operator will be using the Basic Editor to create the program and that Editor requires line numbers to be present. The absence of line numbers, although perhaps strange to a Basic programmer to begin with, does give him a great deal of freedom. Programs will be simpler to code and far, far easier to understand at a later date. A number of Basic statements and commands have been eradicated and replaced by new ones. The most important statements and features of PL/B are as follows:

A whole new group of statements called the DO group which specify repetitive execution of the statements within the group. In its very simplest form the do-group is functionally equivalent to Basic's FOR/NEXT with the exception that in Basic such a loop is executed at least once even if the initial value exceeds the final value. PL/B removes the need to make a separate test to branch around the loop in such a case. Additionally two logical tests are offered to cause termination of the loop and the UNTIL option which is tested at the bottom of the loop. The former, of course, will cause termination when false and the latter when true. Basic supports additional execution of multiple statements only to the extent that they are all contained within a single program line and the same remark applies to alternative condition execution, the ELSE statement. This forces the programmer into contrived controlled coding which inevitably becomes extremely difficult to understand at a later time. PL/B supports any number of statements which may be executed as the object of the THEN or as the subject of the ELSE. The SELECT statement heads a select-group which has to some extent been described under SBASIC. A typical selection would be the use of the command WHEN. Thus in PL/B when coding is defined as SELECT, one can write (paraphrase) WHEN expression I DO, action group for expression I. An optional OTHERWISE clause may be added, thus OTHERWISE DO. The procedures and calls group provides an easy way to use subroutines without resorting to GOSUB and again this has been explained in the SBASIC description above.

The % INCLUDE statement is a programming management technique which can save a great deal of development time and

involves building libraries of commonly used code. The statement causes code to be inserted into the resident program from an external source at translation time.

The PL/B programs will be coded using the Basic Editor which is as you would code a normal Basic program. When the coding is completed, however, the PL/B translator is invoked to convert the PL/B statement to acceptable Microsoft Basic. The PL/B translator requires about 4K of storage at translation time. This is not really an encumbrance because after translation the block is free and will be used at execution time for strings and variables.

AUTOMAP — EXTENDED BASIC MAPPING SUPPORT

This program saves the programmer valuable time in creating a formatted screen. The normal task of communicating and displaying information on the screen is completely automated with simple SEND and RECEIVE statement commands. Many different types of information can be sent and received from the operator with the use of a single command. Essentially, therefore, the product is designed to automate for the Basic programmer the tasks of presenting information on the VDU and accepting information from the ultimate keyboard operator. Programmers using this utility will normally use much less memory and will execute more quickly than by using normal input and output methods. The utility is patched into the Basic interpreter so requires no additional memory or disk space. The system consists of two major components. Firstly the Off-Line Component which is a conversational Basic program utilised to describe to the system the screen formats which the programmer wishes to use. The On-Line Component becomes a part of the interpreter at installation time. Commands are issued to it from within the Basic program to initialise the screen, send data to the VDU and receive the data from the keyboard operator. The interface between the program and the On-Line Component is via a new verb, SCMD, plus various arguments.

AUTOFILE — AUTOMATED DISK INPUT/OUTPUT

The task of moving data information to and from disk files in Microsoft Basic has never been a particularly easy nor elegant task. The FIELDed variables cannot be directly referenced by user logic. Autofile gets rid of these problems. Furthermore programs which use the Autofile facility will normally use less memory, will be coded and debugged more quickly and finally will execute more quickly when doing disk input/output. Like most Snapp programs Autofile when installed becomes part of the Basic interpreter and provides the enhancements without needing any additional memory or disk space. The connection between the Basic program and Autofile is made by use of a new verb, SCMD, together with a number of arguments. When using Autofile the FIELD statement is not required. This in itself gets rid of one duplicate variable set and the difficulties sometimes attached to FIELDing. A third argument is added to the GET and PUT verbs. This is a string expression defining the program variables moving to and from the file. In processing the new format GET and PUT statements, all necessary conversions are performed automatically completely eliminating the normal statements associated with those two verbs such as LSET, RSET, MKI$, MKS$, MKD$, CVI, CVS and CVD. Another benefit of Autofile is that it is no longer necessary to be concerned about keeping the buffer numbers in synchronisation between the FIELD statement and the GET and PUT statements. A final advantage of Autofile is that a new data type is implemented which only requires one byte and is used to store positive integers in the range 0-255. In summary, if like most of us you are not comfortable with the normal way of random filing then this program will have a lot to recommend it.

EXTENDED BUILT IN FUNCTIONS — THE BIGGIE!!

Snapp produced Extended Basic originally for the Model II, but now also, as described above, for the Model III which in our opinion are almost essential for the programmer that uses his machine frequently. It is quite fantastic how that program can cut down programming time and make it both more profitable and pleasant. Personally we felt that there was little more that could be done, but this program takes the extensions far further, and before we forget, we should mention that it is entirely compatible with the previous Extended Basic. Thus this product is a collection of much needed additions to the Model II interpreter which will greatly extend its convenience and utility. As with Extended Basic the features become a part of the interpreter and provide the enhancements without requiring any additional memory or disk space. There are a number of interesting features in the product and we will be going through them individually, but of special importance is a super fast in-memory sort routine which seems to be the easiest to use and most generalised of anything available. The features are as follows:

PEEK: This is almost exactly the same as the same command for the Model I and III. It extracts one byte from the specified memory location.

PEEKW: This is essentially the same as PEEK, but extracts a word, that is to say, two bytes from memory.

POKE: Again much the same as the Model I and III commands. It replaces the contents of a specified memory location with a one byte number laying between decimal 0 and 255.

POKEW: As above, but any integer within the capability of the machine may be entered.

XDAT$: Extracts the current date, unfortunately in the American format MM/DD/YY.

XTIM$: Returns the current time of day in the format HH.MM.SS.

ETIM$: This one calculates the difference between the two times format doing the same as the previous feature. Most of the Extended Built In functions the command FN is used. Thus, PRINT FN ETIM$(''09.00.00'',''11.00.00'') = '02.00.00'.

FILES: This command will return the number of file blocks currently allocated by the machine.

SRT: This command will sort one or more arrays into a specified sequence. The syntax is: 'stexp' is a string expression containing from 1 to 32 iterations of the sequence ''(+ —) (*) array name (,....)''. The + or — indicates that (1) this array is to participate in the 'sort key', which means it helps determine the final order of the results, and (2) indicates whether the sort logic for this array is to be ascending or descending. The first array name which is not prefixed by a sign terminates key construction, and that and all subsequently named arrays become 'tagalongs' to the sorting process; which means that they will be sorted, but will not participate in the decision process. The *, if present, indicates 'special sequence mode' for that array only. Special sequence mode is meaningful only for strings and integers. For strings, special sequence mode means that a shorter string is to be logically padded on the right with blanks when making the comparison to longer strings. Without this special sequence mode, ''X'' will precede ''X'', according to Basic's standard comparison algorithm. With special sequencing, they will compare equally. For integers, special sequence means to treat the numbers as unsigned binary, rather than signed binary. This will be most useful when sorting machine addresses. 'nmexpl', if present, specifies the lowest numbered element of the arrays to participate in the sort. If you omit this specification, it will default to 1. If you use the zero elements of your arrays, be sure to specify this value, or the zero elements won't get sorted. 'nmexp2', if present, specifies the highest numbered element of the arrays to participate in the sort. If you omit this specification, it will default to the minimum size of the arrays listed in 'stexp'. The arrays to participate in the sort may be multi-dimensioned arrays, but they will be treated by the sort as if they were singly dimensioned arrays. Example: II = FN SRT (''+A%'') will cause the array A% to be sorted in ascending sequence, with all elements of the array participating except the zero element.

SCMD RUN: Runs a program and changes number of currently allocated file blocks.

SCMD OPEN: Opens a sequential file which may or may not already exist in Extended mode. In other words, this command allows the programmer to add to sequential files.

SCMD ROW: This is a particularly useful one which hitherto had to be placed in a small machine language program to be accessed by the USR command. It allows the user to protect a portion of the video display from scrolling. Up to 22 lines at the top of the display can be so protected, thus when scrolling occurs only the lines on the screen below the protected area will be changed. Very very useful when printing out tables and lists and it is desired that the column titles should remain visible.

SCMD CLEAR: This will allow you to specify the number of file blocks to be allocated at the same time that high memory and string space is specified.

SCMD ARRAYS: Clears or erases all arrays.

SCMD "CURSOR": With this command the size and display format of the Cursor can be specified. The height of the Cursor is stipulated in scan lines in the range 1 to 10. The display format may be either steady, non-displayed, blinking at twice the normal rate or blinking at the normal rate.
SCMD "LMSGON": When this switch is on Long Error messages will be displayed. Bearing in mind the amount of time it can take to check in the manual as to the meaning of the abbreviated messages this feature is not to be overlooked.
SCMD "LMSGOFF": Switches off the Long Error messages.
VIDEO$: This is another very useful one. It enables the programmer to read information from the video display and store it in a string, thus X$ string equals FN VIDEO$ (0,0,80) causes the contents of the entire top line of the video display to be assigned to the string variable X$.
ID$: Reads the diskette name and returns it to a string.
PEEK$: This and the next one are interesting adaptations of the PEEK and POKE commands. This one extracts multiple characters from a specified memory location and returns the contents to a string.
POKE$: Places the contents of a string at a specified memory location.
UC$: Converts a string to upper case.
LC$: Converts a string to lower case.
SCMD"VDOFF": This command turns the Video Controller Display completely off. It is particularly useful when the program is making extensive updates to the video display as the operator will not see the flicker and black streaks so commonly seen.
SCMD"VDON": Turns the Video Controller Display back on.
MAX: This returns the largest value from a user supplied list.
MIN: The reverse of the above.
FMT$: Arranges data into a string variable similar to the existing PRINT USING command.

As can be seen from the above, this is, to say the least, an extensive program and really has a little bit for everybody.

XSCREEN — HARDCOPY OF THE SCREEN

A screen print facility is probably one of the most useful things that one can have. In fact, in some circumstances it can be well nigh essential. Tandy, understanding this, have incorporated such a facility in the 2.0 version of the Model II TRSDOS. Unfortunately the appropriate command has to be accessed from DOS, thus if a Basic program is running a demand for a screen copy must be made after using the BREAK key and halting the running program — whereafter, of course, a "SYSTEM SCREEN" command will be made. This is rather clumsy and partially disturbs the screen's contents. XSCREEN permits the operator to make hardcopies of the video display to the printer on demand without disturbing the processing program. The routine requires no user memory and may be intialised in a number of different ways including from a Basic program. Once the facility has been initialised it is only necessary for the operator to depress the CTRL key simultaneously with the minus key. The screen is then automatically printed out.

CONVERT — HELPING TANDY OUT

One of the decisions coming out of Fort Worth that we do not think anybody has been able to understand is their election to use the Ryan-McFarland Compiler for the Model II. This, in our view anyway, has a number of deficiencies, the most important one was (and due to this program we use the past tense advisedly) that any existing programs written for the interpreter would have to be completely re-keyed into the computer so as to be acceptable to the compiler. The reason for this is that Ryan-McFarland uses a completely different file format to Microsoft. This program addresses this very real problem by automating the conversion process for any sequential files from Microsoft (F) format to Ryan-McFarland (V) format and vice-versa. Thus, if you have a Compiler Basic Development System, catalogue no. 26-4705, from Tandy, your life will be made a lot easier if you purchase this package.

I TO II — MODEL I TO MODEL II CONVERSION

When the Model II was first introduced Tandy were kind enough to supply us with a utility program which enables programs and data files up and running on the Model I to be transferred to the Model II. On page 30 of the catalogue we introduced a service whereby we would carry this out for customers. In fact this service has changed somewhat over the months because on a number of occasions Tandy have given us permission to supply customers with copies of the actual transfer software. However, whether programs are transferred by us or by the customer, the resulting program on the 8" disk is still in the Model I format. This new program from Snapp assists in converting Basic programs from the Model I to the Model II by automatically adjusting or flagging the modifications that must be made before the program will actually run properly on the Model II. Specifically it automatically adjusts all PRINT@, PRINTTAB and PRINTUSING statements to compensate for the difference in syntax and screen size. IF statements must have a matching THEN on the Model II and this program will automatically flag any such statements which are incorrect. Finally, it will flag any Model I keywords which are not available in Model II Basic. The conversion report may be directed either to the VDU or to the printer. The PRINT@ and PRINTTAB conversions allow placement of the smaller Model I screen at any desired location within the Model II screen.

BPRINT — TWO PRINTERS AT THE SAME TIME

The purpose of this routine is to allow a Basic program to operate a serial printer attached to the Model II Serial Channel B concurrently with the operation of a parallel printer attached to the parallel port, thereby supporting two printers, each printing different information under program control. Whichever way you look at it that is a pretty neat trick. The parallel printer output is coded in the normal way in the Basic program, but the BPRINT facility is called by a USR statement. Each time that it is requested that information should go to the serial printer such information is implanted into a string and invoked with an appropriate Basic statement. The string expression may include pretty well anything that is legal with strings such as quoted string constants, string variables, concatenation etc. It is not necessary for the string to be terminated with a carriage return as BPRINT will do that for you.

ULTRAPPD — MODEL II AND THE ELECTRIC PENCIL

Although we stock the Scripsit Word Processor for the Model II we thought it would be advantageous for customers who prefer the Electric Pencil on that machine to stock this Driver routine. The program is a Driver designed to permit users of the Electric Pencil IIB to take advantage of the proportional spacing modes of Tandy's Daisy Wheel II and the Line Printer IV. It is also applicable to Centronics 737. These printers support variable carriage spacing depending upon the width of the character being printed and a "dot space" which is a space only a tiny fraction of an inch wide. The Driver allows the user to take advantage of these features when using the Electric Pencil IIB and produces copy which is very close to typeset copy.

HAZELHOST — HOST/TERMINAL

The Host/Terminal Communications package for the Model II is described on page 48 of the catalogue. This present program is for users operating the Hazltine 1500 Terminal although it will also work on the 1510 and 1520 which use the 7EH lead character options.

TELEHOST — HOST/TERMINAL

This is the same as above only for the Televideo 912C.

DOUBLE TAKE 3741 — FOR IBM USERS

This system is designed to support data interchange in either direction between Model II TRSDOS and IBM or IBM-like machines which are capable of reading and writing single sided, single density ''Basic Data Exchange'' diskettes. Machines believed to support this format include, but are not limited to, IBM Models 3540, 3601, 3602, 3740, 3741, 3742, 3747, 3773, 3774, 3775, 3776, 3777, 3791, 3881, 3890, 4962, 4964, 5231, 5320, 5340, 7840, 7841, Series/1, System/32 and System/34.

Hints and Tips — July 1981

Last month I promised to give somewhat more serious tips and as I am frequently chastised by Model II owners that I hardly ever mention their machine in this column, let me start off with one for them. In the 1.2 TRSDOS the patch was given to get rid of the date question on power up, but I do not think it is contained in the 2.0 update. The correct instruction to get rid of both the date and the time is:

PATCH SYRES/SYS A = 2367, F = 73, C = CA

If you want to take out just the time question, the instruction is:-

PATCH SYRES/SYS A = 2390, F = 0A, C = 39

Although Tandy will probably shoot me for this, if you want to get rid of the Tandy logo then the patch is:-

PATCH SYRES/SYS A = 24D3, F = 00, C = 3B

Installing all of the above patches is rather nice because you get a much shorter boot time and you go straight into TRSDOS READY.
A small one for customers with a Line Printer. Sometimes one wants to use just the keyboard rather than the keyboard and interface so that the Reset button is available without having to hold down the BREAK key and getting a complete reboot. I do not know about anybody else but quite often I do this forgetting that I am eventually going to use the printer. If this happens to you, all is not lost because when you find that you want a printout just switch the interface on and execute your printer command. You will not get any more memory, of course, and you will lose the Reset key, but at least you will have your hardcopy. Sometimes we all make mistakes — some of us more than others — a common one is apparently to destroy the resident Basic program such as typing NEW when you did not intend to. Some of our programs provide for the rescuing of the program, but a rather easy hint is that when the program is lost POKE 17130,1 then type SYSTEM and answer the first prompt with /11395. You will now be able to list the program and also save it out to cassette. Only this should be done; the use of other commands such as RUN will have unpredictable results. If you are in disk Basic then POKE the 1 to 26811. Now for a couple from customers. Mr. Page of Brighton reminds you of the equation to find the numbers to POKE into 16256 and 16527. These contain the start address of the USR routine in Level II. Normally one is in the position of knowing this number in its full decimal form, but it has to be split into two decimal numbers less than 255, required at 16256 and 16527. Take your start address, say 32417, execute the command PRINT INT (32417/256), your answer will be 126. Then print 32417-256*126 and the number will be 161. These are the two values to POKE. Thanks to the designer of the 8080 chip (!) the two numbers must be swapped so 161 goes into 16256 and 126 into 16527. Mr. Foy of St. Helens casts some light on the FOR-NEXT loop bug in ROM which we have mentioned, I think, a couple of times in previous columns. Tightly nested loops seem to lose synchronisation. Mr. Foy says that the reason is that the next statement variables are separated by commas — NEXT Z, Y, X can fail, but NEXT Z: NEXT Y: NEXT X will work without problem.

CHRISTMAS LISTING

We must apologise for the delay in the publication of this edition to the Catalogue. The Personal Computer World Show in September was a tremendous success but brought an awful amount of work in its wake. We were therefore compelled to cancel the September edition. This Listing is big enough to make up! One result of the combination of the two lists is that this one not only has the usual collection of new Christmas games but also some very important programs of a more serious nature.

MYSTERIOUS ADVENTURE ADVICE SHEETS — IN CASE YOU GET STUCK

Advice sheets are avilable for those customers who get stuck during an Adventure. It should be emphasised that they are not step by step instructions, but are merely various items of advice which are sufficient to get you unstuck, but not so much as to solve the whole Adventure for you.

ALIEN ARMADA — YOU MAY THINK BETTER THAN INVADERS

This is a straightforward arcade game in many respects similar to the well known Invaders. There are no buildings to hide behind at the bottom of the screen, the laser launcher is out in the open and has to run the gauntlet of the alien invaders' bombs. Unfortunately, unlike the Invaders, the aliens do not stay put in their neat rows and slowly work down the screen. Three or four at a time come blasting out of their formation, dive bomb the laser launcher and drop their bombs at the same time. We feel that many people will prefer Alien Armada to Invaders. The fun is certainly fast and furious and you have to be very quick to get anywhere at all. The program, of course, is written in machine language and sound effects are provided. Maximum score is 99,990 and either one or two players may take part. There are three levels of difficulty. In the first the attacking aliens and their bombs are at the slowest speed. Personally we have not yet got beyond this. The intermediate level means that the attackers will continue to move at the same speed, but the bombs they drop speed up, and in the advanced level the attackers move faster as well as the bombs. The player is given three laser bases to begin with and can only attain more when he gets to 5000 or more points. There are four rows of 10 aliens per row and the points go from 10 to 40 depending on the row in which an alien is hit.

DREAMWORLD — A SEQUEL TO FAIRYTALE AND WONDERLAND

These are all Adventures with fairytale and nursery rhyme contents written in Basic. As a matter of fact it was not intended that they should be a series when Keith Campbell wrote the first one, Fairytale, but they have been so well received that Wonderland and now Dreamworld have followed the original. Dreamworld is based on the following stories and rhymes: Oliver Twist, Wizard of Oz, Christmas Carol, Peter Pan, Jack and Jill, Ding Dong Bell, Old King Cole and Little Jack Horner, with, as the author says, a guest appearance from Santa Claus. The network of the game comprises a real world and a fantasy world. It is possible to sleep and dream when in bed and subsequent dreams land the player in different locations and open up successive sections of the network previously inaccessible. The player can move from dream world to real world, but not vice-versa, hence quite often fantasy becomes confused with reality. The command ''WAKE'' always terminates a dream and returns the player to his bed. There are 12 teasures in Dreamworld and about 35 locations. Although it would be foolish to pretend that these programs do not have more appeal to children than to grownups, it is equally fair to say that the grownups that we have seen playing it seem to thoroughly enjoy (once they get over the initial embarrassment) a trip down memory lane.

TENPIN — TENPIN BOWLING ON THE COMPUTER

This is another program from John Allen with the emphasis on graphics. It represents a very good simulation of a game of Tenpin Bowling. So far as is known, normal Tenpin rules and regulations are followed and the game is certainly good fun to play. There can be between 1 and 4 players and sound effects, of course, are included. The program is written in machine language for speed. When you start the game the ball comes up the right hand gulley of the lane, the ball is taken across the lane with either one or two arrow keys and thrown with the space bar. As on a regulation Tenpin Bowling alley, there are marks about one third of the way down the lane and spin can be placed on the ball with an arrow key, so long as it is done before the ball gets to the marks. In the same way, the speed with which the ball leaves the hand can be controlled by the length of time that the space bar is held down. The faster the ball goes down the lane the fewer the pins that will be knocked over. The ball, in other words, goes straight through. On the other hand, the more spin put on the ball, the more likely that the pins will flay all around when hit and strike other pins. Two balls, of course, are played per frame. We rather feel that it is harder to play than the actual game, but as with John Allen's Pinball and Astroball, it does follow a real life game very closely. If there is any criticism it is that although the pins always fall in a logical manner, they do not always appear to fall in the correct order, that is to say, if logically the ball is going to hit a pin on the first rank and one on the back rank, one sometimes gets the unusual appearance of the one on the back rank falling before the one on the front rank, but this is a very small criticism. All in all, it is very good fun.

SPACE ROCKS — LIKE ASTEROIDS? NOT QUITE.

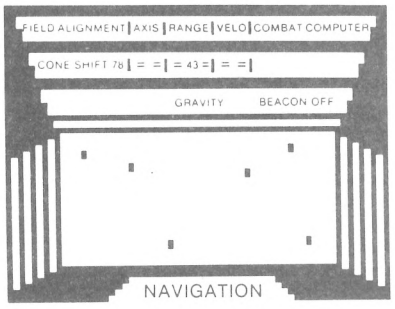
In that this arcade game is concerned with rocks falling all over space it is going to be compared with Asteroids, but in fact it has a little of Asteroids and a little of a space battle in it. Essentially there are two objects of the game. Firstly to break up asteroids before they break you up, but secondly to destroy time bombs before they detonate. The normal hyperspace function is also included. Each player starts with three ships. When you have scored 10,000 points you will get another. The player can only shoot four shots at one time. Time bombs appear on the screen randomly. There are two types, one starts from the left hand side of the screen, the other from the right. Both move horizontally, of course, and there is a number in the middle of the bomb which counts down to 0 as it moves across the screen. If you do not shoot it down before it hits 0, the bomb explodes, blowing up the ship and every rock on the screen. It is a flexible game in that there are no less than 10 different levels of play available. The level influences the number of rocks that fly around at the beginning and how often time bombs appear. The value of the time bomb countdown is also affected. The first five levels are regular speed rocks or asteroids and go from 1 to 5 rocks per screen. The last five levels all have super speed rocks and again go from 1 rock to 5 per screen. Space Rocks includes a subsidiary game called Space Battle. This enables the player to fight time bombs and enemy ships without worrying about rocks, that is to say, there are no asteroids in Space Battle. Although we imagine it is up to everybody to make their own judgement, this feature seems to us to be of more use in providing an opportunity for practising control of your space ship rather than meaning to be a serious game.

SHEEPDOG — MACHINE LANGUAGE VERSION OF AN OLD FAVOURITE

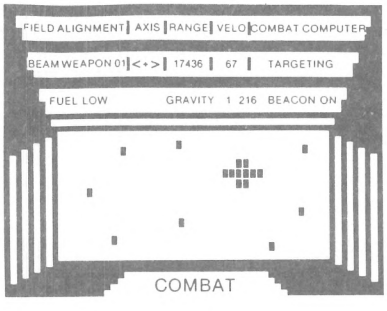
There have been many versions of this popular game whereby the player controls a dog which is supposed to herd sheep into a pen. Indeed, some time ago we offered to supply free a listing of a Basic version. However, the addition of machine language coding to an already popular game supplied us with a program which we could not refuse. There have been a number of improvements to the original concept, particularly the capability of choosing the number of sheep, the speed of the sheep, the speed of the dog and the time allowed for the completion of the herding. Graphic blocks are used for the dog and the sheep. The dog, of course, is easily discernible. Of particular importance, and resulting from the type of coding used, is the ability of both the sheep and the dog to move in a diagonal direction. Most Basic programs allow for the sheep to move diagonally, but it is not quite so easy in Basic to make the dog behave in the same way. In view of the number of game parameters which may be set, the author has included the ability to break off a game part of the way through should the player decide that he wishes to change the parameters.

STARFIGHTER — A NEW SPACE FIGHTING GAME

Adventure International in advertising this program call it the penultimate space war game. We are not at all sure that we understand that phrase, one imagines that the inference is that the final war game will be the end of us all, which may well be a possibility. It is hard to describe this particular game because both the advertising literature and particularly the manual that comes with it are perhaps rather heavily overwritten. The manual, for instance, is entitled "SC-78503 Starfighter — New Pilot Instruction Manual" and throughout it contains rather complicated comments, the theory being that it is the actual manual for the fighter itself and not an instruction booklet for a computer game. Taking a quotation at random, for instance, "The SC-78503 maintains an assigned Hypercharge field (ref: 2,2-5) with a maximum controllable depth of factor 5. This field is utilised by the craft for lambda-plus transportation". To a lot of customers this approach will be very acceptable and the program may well prove to be the penultimate space war game. On the other hand, we did feel it our duty to indicate that the manual is without a doubt heavy going. It is thought that in no place does it break down and become common or garden computer program instructions. Most of the game is played against the backdrop of a console which is from time to time described as Navigation, Drive or Combat. Two examples are shown below:



NAVIGATION MODE, EXTENDED RANGE SCAN HAS LOCATED A TARGET. VELOCITY IS ZERO, CONES SHIFTING FOR DRIVE.



COMBAT MODE, INCOMING DEATHCASTER (See Axis, Range, Outline Display). BEAM WEAPON OPERABLE, TARGET NOT CENTERED & NOT IN WEAPON RANGE. FUEL IS BEING CHECKED, 2 CHARGE FIELDS BUT VERY LOW FUEL IS SHOWN.

The best way to describe the program is an extended Star Trek, but with excellent graphics. It is written in machine code for speed. The enemy is no longer a marauding alien race as in the Star Trek Klingons, but the Petro Resource Conglomerate. The aim of the game is, in conjunction with your race to help wipe out the PRC craft, of which there is unfortunately an unlimited supply. To encourage you, bounty is offered for each kill, although the pilot has to choose between collecting bounty and increasing his chances of promotion, which is hopefully not indicative of things to come in the armed forces. Manoevring the craft is carried out by using the arrow controls. The beam weapon fires a single burst straight ahead, but the wave weapon fires in opposite directions and has a shorter range. It is a complex game basically revolving around the simple theory of killing your enemy. It must be said, however, that strategy and skill, particularly at handling your craft, is an important factor. If you like space action games, you will love this one. If you found Star Trek heavy going after a while, you probably won't.

ASTRONOMICAL CALENDAR — SUN AND MOON CALENDAR

This program is written by Mr. A. J. Woodruff who wrote both Astrolog and Horolog shown elsewhere in this catalogue. As an expert on this subject he has now written a program to make it very easy for astronomers and other interested persons to ascertain various items of data which normally require either the consultation of a number of tables or the use of quite complicated calculations. The data output by this program is as follows:

1) Position of the sun
2) Position of the moon
3) The time of sunrise
4) The time of sunset
5) The time of moonrise
6) The time of moonset
7) The age of the moon

This data is available almost instantaneously for no less than 170 different towns in the United Kingdom, or if the user is not situated in any of the towns contained in data statements of the program then he may enter his position by way of latitude and longitude co-ordinates. As indicated, Mr. Woodruff is highly knowledgeable on this subject and has incorporated into the program all of the requirements of an astronomer, most of which we must confess are way over our heads. A correction for a refraction is incorporated. A correction is also included in moon observations for the parallax effect of the observer being on the surface of the earth. Overall basic accuracy is within one minute of arc for the sun and plus or minus two minutes for the moon. The sunrise and sunset accuracies are within one minute of time. Local times of moonrise and moonset correct for refraction, parallax or dip are accurate to plus or minus two minutes of time. The age of the moon is given in days and hours and is accurate to three hours. The program is straightforward and convenient to use and two options are available for entering a new date with the same locality or for entering a new locality. If neither of these are chosen then the calculations will continue to be based on the locality and date originally entered. For those who need this sort of information we would imagine this program is close to being essential. The calendar, incidentally, is valid from January 1st 1900 to December 1st 1999. The program is supplied on cassette but is compatible with disk Basic.

GIVE AWAY PEN

A word to all you lucky people that have been sent one of our square blue give away advertising pens! Unfortunately there was not enough room on the barrel to say that the pointed end fits the hub of a cassette tape. It can, therefore, be used as a tape winder.

FRENCH VOCABULARY — AN AID TO LEARNING FRENCH ON YOUR COMPUTER

There are a number of ways of learning a foreign language and indeed there are a number of computer programs that have been written to assist. Many of them, however, go into grammar and technicalities of the language more than is necessary for the average user who wants to learn sufficient of a language to enable travel in the appropriate country. This program, which teaches the vocabulary of French, has been written with simplicity and efficiency in mind. It is highly recommended as a tool kit to enable the learning of French words either for the traveller or the student up to 'O' level. Included with the program are 10 vocabularly data programs each containing 300 French/English word pairs. The total of 3000 word pairs provides a comprehensive basic French vocabulary. Each French word, of course, is matched with the English word, giving its meaning. If there is more than one meaning the most common is given, and if there is no exact translation the closest available is given. Because of the importance of gender in French, the nouns have been written with an article to indicate whether they are masculine or feminine and the student must use them. The nouns, which make up well over half of the vocabulary, are mostly arranged according to subject matter. This greatly aids learning. Each set of 300 word pairs is sub-divided into 10 groups of 30. Frequently, more than one group is assigned to any particular subject. For instance, in the first set of 300 the first two groups are concerned with motoring, the next two to words that would be required in and around a town. One group is assigned to airport words and so on and so forth. All of this data is used in three principal tests, a speed test, a multiple choice test and a spelling test. All these tests may be used either in the English/French or French/English direction.

Speed test

In this test the word is flashed onto the screen and a countdown starts at whatever speed has been selected by the user. Before it reaches zero the user should say out loud the translation of the word. As he does so he presses the space bar to stop the count-down and display the correct translation. If he fails to do this on time a hesitation time is measured and if he has said the wrong word or has been unable to remember the translation he indicates this to the computer. All words where there is hesitation or error are repeated later in the test. In the end a score is displayed out of 1000 which has taken into account the number of errors, hesitation time, speed of the test and number of words being tested. Obviously with this test it is possible to cheat, but for the serious learner it is an invaluable aid.

Multiple Choice Test

With this test a word is flashed onto the screen with five possible translations. A clock is started and the user has to type in the number of the correct word as quickly as possible. Errors and time are recorded and are taken into account in the final score. Words which produce errors are repeated and in normal use are cheat-proof.

Spelling Test

The spelling test has been included to avoid the danger of someone learning to recognise words only in broad outline. It demands that they type in the correct spelling of the translation on the screen. Errors are repeated later and the final score is given. Spelling must be exact. In normal use this test is cheat-proof.

When the final score is displayed at the end of each test the user can decide whether to repeat the test, do a different one or exit the program. While the program is running, incidentally, the Break key is disabled. A further nicety is that in all tests in which repeats are made, that is to say, questions are asked again that have been inaccurately answered, the order of such questions has been mixed up. It is possible for the user to construct his own data tapes for use with this program and guidance is contained in the instructions which accompany the program. A very nice feature of this program is that the data tapes are not of the usual type loaded under the INPUT command. The data is held in data statements in Basic program lines. When the governing program is initiated it is blocked off and data is fed in as additional data lines, then the block is removed and the program merged with the data and this is done every time that new data is required. This technique speeds up input of data by a substantial factor.

SAM LOYD — A PUZZLE

It certainly is a puzzle, in fact there is so much in it that it is hard to describe. At some time or other we have all seen the hand held puzzle, nowadays usually in plastic, but in ''olden'' days, metal, wherein 15 small blocks are free to move in an outer square which has room for 16 blocks, one block space is spare. In other words, the idea is, with the normal puzzle, that the blocks are numbered from 1-15 and one has to arrange them so that they read numerically from left to right. Sam Loyd is based on this premise, but it has five choices of puzzle or function. The first is a computer representation of what we have just described, in other words, the blocks to be moved are numeric. The last two options that one is given when starting the program are concerned with making and saving your own puzzle and

loading such a puzzle from tape. The other two versions or puzzles require a little more explanation. The first is essentially a crossword made up of letters which can be read either vertically or horizontally into meaningful words. On command the program will shuffle the letters and it is then up to the player to attempt to solve the puzzle. Alternatively, he can instruct the computer to solve it itself, in other words, to ''unshuffle''. All commands, incidentally, are entered by placing a cursor on to the tile to be moved. This program was written by Mr. M. Norris who wrote Space Eye, Cube Hunt and others, all of which are well known for their excellent graphic content. This program follows in the same tradition. The tile graphics are first class, but of special relevance is the final option of the puzzle — a picture puzzle. With this, the blocks, when arranged correctly, form a picture. When shuffled, obviously they do not. In fact it is quite surprising how a perfectly normal house can change when its picture is split into 15 parts and they are all jumbled up. One should not denigrate the cleverness and interest of the number and word puzzles, but we feel sure that it is the picture puzzle that will be of most interest to purchasers. It is not only difficult but we do not feel that it is too much to say that it is an example of TRS-80 and Video Genie graphics at their highest level. As mentioned, the picture puzzle that is included in the program is a picture of a house. As if this was not enough, a data tape is supplied which contains data for four other pictures, namely a mountain scene, the TRS-80, a bear and a message. We briefly mention above that it is possible to make one's own puzzles. This is done by using the cursor keys to draw a picture or, for that matter, anything else, on the screen. When you are satisfied with your design the computer will compile the puzzle and, again as mentioned above, if you wish you may save it to tape for future use. This program is a first-class example of an old and well known theme being taken, enhanced and adapted to make it into a first-class microcomputer game or puzzle program.

EDAS — A NEW EDITOR ASSEMBLER FOR THE MODEL I AND III AND GENIE

This is a new disk based Editor Assembler available for the Models I and III TRS-80 and I and II Video Genie. Almost all of the currently available Editor Assemblers have been based on the original one written by Microsoft for Tandy's. This was a cassette based program, but it has been adapted principally by Apparat in NEWDOS so that it can write to and from disks. For some time it has been apparent that a completely new Editor Assembler is required in the market, and particularly one which will assemble direct into memory. It was with this in mind that we are introducing EDAS.
EDAS has a number of advantages over the previous Editor Assemblers. The principal one has already been mentioned, namely the ability to assemble direct into memory. All of the earlier Editor Assemblers had to be outputted either to tape or disk and then fed back in. The exception to this is the Microsoft Editor Assembler Plus available on cassette, and as a matter of fact this program bears quite strong resemblances to that program. EDAS supports all of the ''normal'' functions of an Editor Assembler and in addition the following features are available:

Assembly Features

1) A *GET directive allows assembly directly from disk source files. This takes the place of a Macro feature and provides an assembly capacity essentially limited only by the size of the symbol table which is retained in memory. Source files may be linked by multiple *GET statements in the program allowing literally hundreds of thousands of bytes of source code to be assembled.
2) Conditional assembly is provided through the use of an IF directive. Allowable conditions are greater than, less than and equal to.
3) Allowable operators are addition, subtraction, shift, logical and, logical or, exclusive or, multiply, divide and modulo.
4) As mentioned, object code may be assembled directly to memory or to disk if preferred. A Branch command allows jumping to the code in memory for debugging with an exit provided back to the Editor Assembler with the source code intact.
5) Some four or five pseudo operations on a line printer are allowable.
6) A COM pseudo op code allows comment lines to be written to a disk file along with the object code. These comment blocks will not be loaded with the object code, but merely provide an easy way to store such things as copyright messages in your object code files.
7) Hexadecimal, decimal, octal or binary are permitted for constants.
8) The Assembler generates a symbol table sorted in alphanumeric order. The output is in three across format with symbols of up to 14 characters allowed. An additional cross reference file may also be generated for use with the XREF mentioned later.

Editor Features

1) EDAS will write and load text files directly to and from disk with provision for text file concatenation. Many different types of text files can be loaded with the Editor including files without line numbers.
2) The Editor can write source files with or without line numbers and with or without a header.
3) The Editor supports block moves of lines, global replacement of text strings over the entire buffer and a Find command to locate all occurrences of a specified text string.
4) Line editing maintains command syntax identical with the Basic Editor in the interpreter and therefore, of course, is similar to the earlier versions of Editor Assemblers. In EDAS, however, Character Insert, Delete, Change, Locate, Kill, Hack, New Line, Display Line, Quit etc. are all supported.
5) The text buffer can be printed in whole or in part with or without line numbers.
6) Disk directories may be displayed and files killed whilst remaining in the Editor Assembler.
7) A memory utilisation command is available which will display the bytes used by the text, the bytes available and the first free address.
8) A rather nice command permits the viewing of a disk source file without actually loading the file into the text buffer.

In a 48K machine approximately 32K will be available for the text buffer. This figure, however, may be increased by approximately 5K by deleting the assembler portion of the program. Although this, of course, is large, it should be remembered that the *GET command is available permitting assembly direct from disk source files. In addition to the above, there are three separate utilities provided. The first is a general purpose disk to disk, tape to disk and disk to tape program that has been designed to provide the capability of appending two or more CMD, CIM or OBJ files or SYSTEM tape files, therefore EDAS has complete compatability with such files. Offsetting is permitted. SYSTEM cassette tape files can be created from non contiguous blocks of memory. The second utility is entitled TTD which is a program for transferring to disk a source cassette file created with earlier Editor Assemblers, particularly the Radio Shack original and Microsoft's Editor Assembler Plus. The third utility, XREF, is used to generate a cross reference listing all symbols used in source code. EDAS comes complete with an extensive manual in a loose leaf binder.

KUBIK — THAT CUBE AGAIN

Rubik's Cube is now so well known as a puzzle that one almost feels embarrassed in talking about it. It took the country by storm and not many fathers have been freed of the obligation to buy their children one of the many sizes of cubes available. At one time we felt that almost everybody with a computer was also sitting down and writing solutions for it. It is not giving away any secrets when we say that we had a number of versions submitted to us and had, as a result, considered publishing at least two, until the magazines decided to publish programs for solution of the cube. Despite this, some people will prefer to purchase the program ready made, also, at the present time the program that we have seen described in a magazine did not contain graphics, in other words, the cube is represented in a single dimension. This program uses graphics to their best advantage. It is probably fair to say that they are as good as can be produced on the TRS-80 or Genie. It must not be forgotten though that to depict a cube in full dimension on a screen is extremely difficult. The best way of describing the program is to run through its main options. The first is for some abbreviated instructions. The second is a prompt as to whether or not a user wishes to resume a saved position. As will be surmised, the state of the cube or puzzle can

be saved so that it can be restarted at a future time. One particularly good feature of this program is that the saving can be to either tape or disk. In other words, if you are working on the cube in the middle of the night and suddenly decide that you want to go to bed, you can save the cube to tape or disk. The next option is whether or not you wish to enter a position. Although, as we have said, the graphics are probably as good as they can be, use of the program will be enhanced by using a plastic cube at the same time. Accordingly, if you have struggled for some time with a cube to no avail, you can enter that position in with this option. The fourth prompt is for a move on the operator's part. This may either be to turn a face — either clockwise or anti-clockwise — or to view the cube from a different corner. The fifth option is to save a position and we have dealt with this under the command that brings the position back into the machine. The sixth command is used when you want the computer to try and sort the cube out. In view of the billions of permutations possible, it is not practical to say whether or not the machine can solve the cube within a reasonable length of time, hence this command. Although normally solving the cube may come back with a ''position impossible'' or ''piece missing'' message, usually this will be traceable to an incorrect input from the operator. Unless one or the other of these two messages appears, the poor old computer is still working. We have played the cube quite a few times and we have never had one of these messages. As the machine works it will state what it is doing and illustrate the moves needed. Every so often it will require the operator to press the Enter button so as to give him a chance of studying the position before proceeding. When this occurs, the operator can make a separate command which will regain him manual control. The final facility available is a self test, in other words, the program can be made to repeatedly scramble the cube by generating random moves, solve it, scramble it again and so on, ad infinitum. The program has survived 12 hours of this self test without reducing itself to lunatic status.

SPEEDY — CASSETTE SPEED UP ROUTINES

Ever since the TRS-80 Model III was issued, Model I users have cast a longing eye on the 1500 baud rate of the newer machine. So far as the software is concerned, such a routine does not present great difficulties, after all, although we are not suggesting such a criminal course, one could simply copy the appropriate ROM routines out of the Model III machine. In the short term such a course might be practical. However, if one approaches the problem of speed up routines simply on the basis of the software, then one is overlooking the most important fact, namely that however marvellous the software may be, the hardware is not designed for any rate other than, in the case of the Model I, 500 baud. To a large extent, therefore, the software writer has to rely on the tolerances of the hardware, rather than its efficiency. The TRS-80 Model I, particularly the original ROM versions, are well known for their tape loading difficulties. When the Video Genie came out, its designers took note and the cassette input and output circuits are very ''tight'' and, at 500 baud, very efficient. The result of this is that speed up routines tend to work better on the TRS-80, indeed not much above 750 baud will work at all on the Video Genie. In that the software writer is relying on tolerances, rather than the more normal strict design criteria, it follows that a speed up routine tied to a specific baud rate will work on one machine, but may not work on another. Mr. Titcombe, the author of this program, has taken what we feel is the best approach, namely he has given the user the opportunity to choose between six baud rates, in addition to the original 500 baud. They are 750, 1000, 1250, 1750 and 2000. The user may, therefore, try all of these speeds and find the one that is best suited to his particular specimen of the machine and he can then stick with that rate. As a guide, pretty well any TRS-80 Model I will go to 1250 baud. Probably 60% or 70% will go to 1500. A small percentage to 1750, and very few to 2000. As we have mentioned, the Video Genie in our experience seldom goes above 750 baud. Before we get a rude letter from our friends at Lowe Electronics, the importers of the Genie, we would like to reiterate that the reason that the Genie does not go to higher baud rates is because of the excellence of the design of the circuitry — not the contrary.
There are three parts to this program. The first permits the loading, saving and verifying of Basic programs at the baud rates mentioned. The second part is exactly the same, but set to one baud rate only, namely 1500 baud. The third part is a very handy idea which will put a loader on to your Basic program that sets the baud rate of the machine to the one selected when the program was saved. To clarify, if one decides that one is going to save a program at say 1250 baud, then this loader option gives the chance of putting in front of the Basic program 255 bytes which will set the computer to the baud rate chosen. It is an ordinary machine language program, so one simply types SYSTEM and LOADER. When the loader is loaded, the user is returned to Basic whereupon he loads his Basic program at the increased baud rate. The addition of the loader to the program is optional, but it does make it awfully handy. All of the programs use the commands SAVE, LOAD and LOAD? in place of CSAVE, CLOAD and CLOAD? Finally, a word of caution. We, as a matter of personal preference, have some reservations on the viability of a program which loads another program. In other words, although one will get increased speed of cassette access, it remains a fact that one is having to load another program in order to get it. If the LOADER option is used, then this, of course, is less meaningful, but it is still present. It should also, in fairness, be stated that unless the LOADER option is used the transportability of high speed programs is a problem.

KEYBOARD MASK — MASK OUT THOSE UNWANTED INPUTS

Keyboard Mask is a subroutine accessed via the Basic USR function. It is, of course, written in machine code and is loaded with the SYSTEM command. The purpose of Keyboard Mask is to provide the programmer with an easy way of making sure that only the required data types are accepted as keyboard inputs. For example, many programs require only numeric input, but the Basic programmer has to code wasteful routines to check that only numeric inputs have been made. The same comments apply to alpha input. The subroutine, therefore, is not only easy to use, but saves a good deal of Basic coding. A mode is also included so that certain control functions can be tested for. The Mask is constructed by way of passing a parameter to the subroutine which, in accordance with the normal Basic practice, is included in parenthesis after the USR statement, thus USR(n). The value of n, therefore, decides the characters which will be accepted in the normal mode. The following categories or combinations of them may be defined for acceptance: Numeric, Decimal, Hexadecimal, Alpha (upper case), Alpha (lower case) Characters. In extended mode, which, it should be emphasised, can be mixed up with normal mode for greater versatility, the following codes are tested for: Left Arrow, Right Arrow, Up Arrow, Down Arrow, Enter, Clear and Break. Keyboard Mask is compatible with disk Basic and disk version is available.

A note on Superscript. Superscript is now available for the Model III as well as the Model I. The modifications have been such that it is now necessary for a purchaser with a Model I machine to have a lower case modification. Although the Tandy one is preferable, the one contained in the Electric Pencil manual will do.

TEXPRO — A TEXT/WORD PROCESSOR PROGRAM FOR TAPE

There is a fairly restricted market for a word processor for tape users of 16K up. It is very difficult to write a good word processor or even a good text editor which will fit into 16K and can support only tape storage. We are now happy to be able to introduce Texpro which is suitable for machines of 16K, 32K and 48K for the TRS-80 Models I and III and the Genie I and II. It is a very nice little word processor and incorporates a number of features that one would expect to see on its bigger brethren. There are different versions for machines with upper/lower case and those with only upper case. There is also a different version for the Model III, so it is important that these details should be mentioned when ordering. Unless otherwise stated, we will be describing the version suitable for an upper/lower case machine. In the main there are no differences in important functions. Texpro incorporates its own lower case drivers, together with its own keyboard and video drivers. Hence it is able to add some special characters, for instance, left and right brace brackets are available together with a vertical divider. The £ is also supported with the screen. The printer support, of course, will depend on the printer used, indeed this remark applies to most of what we have said on the special characters. Texpro is a menu driven program and 11 functions are available as follows:-

1) Input — This supplies normal typing facilities of course.
2) Edit — The command to be used for insertion and deletion of characters or lines. The cursor is alive and controlled by the four arrow keys.

3) Display — With this command the user reviews the text on the screen with downward scrolling controlled by the down arrow.
4) File — This command stores the current text on cassette.
5) Retrieve — The opposite of the above, to bring text in from cassette.
6) Merge — To rearrange the text in lines of reasonably uniform length. Of particular use after insertions.
7) Tidy — This is the command used to right-justify the text. Only justification by the insertion of spaces is supported.
8) Print — Sends the current text to the line printer.
9) Combine — This retrieves the sequence of segments which have been filed in order on tape and prints them out as one document. This is a particularly useful command for 16K owners.
10) Set — Alters the parameters which control some of the other commands and also the tab settings.
11) Verify — This is an unusual one and is of use to owners with upper case only.

We will now try and explain these commands in a little more detail. When input is called, the last line of the existing text will be displayed at the top of the screen which, of course, is blank on an initial run. Text is then typed in in the normal way. There are one or two exceptions to the normal use of the keys whilst in this command. The Clear acts as a repeat key, the unshifted Left Arrow gives the normal function, but a shifted left arrow will delete the entire line. The Enter key causes the line which has been typed to be stored in memory. The right hand arrow acts as a tab key. Initially the tab positions are set every eighth character across the page, but they can be changed using the Set command. The Edit function gives access to text already typed. Whilst editing is in progress the line being edited is marked by an arrow pointing towards it from the right. The three previous and three following lines are shown above and below respectively with double line spacing. A message is displayed indicating the line number being edited. The cursor is controlled by the arrow keys and any text typed is added at the cursor, the remainder of the line moving to the right to make room for it. Text is deleted by using the shifted left arrow. Changes entered are not immediate, they will not actually be made to the buffer until such time as the Enter key is pressed. Entire lines may be inserted or deleted. The Display is just that; when the command is called it displays the top line of the text, following lines should be displayed using the down arrow key. An interesting phenomena is that scrolling is continuous, that is to say, when the end of the text is reached the next line will contain the beginning of the text. The File and Retrieve commands are self-explanatory. It is interesting to note that text is already on tape in the form of Basic strings. This is, incidentally, a program written in Basic. When recording is in progress, for instance, as each string is written it is displayed on the screen. Visual verification of data tapes is supported. The Merge function arranges the text in lines which are within a specified range of lengths. This is of importance when the lower limit of line content has not been reached and the next word would go beyond the upper limit. When this occurs the user is asked whether or not he wishes to hyphenate. If he does, then he is asked where. If he does not, then the line is terminated at its current length. The most common purpose of this function is to restore regular line length after insertions or deletions have been made. The Tidy command pads out each line to the current maximum length by inserting additional spaces between words and thus achieves right justification. Spaces are added in a ''wiping'' motion from left to right and then from right to left in alternate lines. The effect is pleasant and means that one does not get the effect of all the spaces being at one end of the line. The Print function is self-explanatory. Word processors are, of course, infamous for printer support problems, one never knows what weird and wonderful printers there are in use until one sells a word processor! All normal parallel printers are supported. In that the program automatically adjusts memory size for its own requirements and obtains the existing top of memory from the appropriate pointer, it is possible for the user to protect memory for serial drivers so long as they are at the top of memory. It is not anticipated that there will be any great problems in this respect with Texpro because essentially it prints by LPRINTing strings. The Combine command works essentially the same as the Print command, except that it prints text as read from tape rather than from memory. The Set command enables the following settings to be changed: Maximum Characters per Line, Minimum Characters per Line, Lines per Page, Page Length, Print Margin, Standard Paragraph Inset, Tab Positions, Hyphenation and a Print option for normal, small and heavy type for which we must again make the stipulation that it may not work on your particular printer. Finally, on the commands, the Verify is one which we have never seen on another word processor. It is appropriate to upper case machines. Many printers will print out lower case even though the Display cannot display it. In these cases it is often difficult to tell from the screen whether a character is going to print out in upper or lower case. The purpose of Verify is that it goes through the text and indicates which are the capital letters.

HONEST JOE — RACING FROM THE OTHER SIDE OF THE FENCE

The author of this program is Mr. K. Campbell. He has written the Fairytale adventures listed elsewhere in the catalogue and also the Creole Lobstercatcher, so it can be seen that he has a broad and imaginative mind and this is certainly brought out in his latest program, Honest Joe. We always get shot down in flames when we say in these columns that we have not seen a program like the one under description; the mail for the next two weeks is full of examples of that program; but we have not seen a similar program to Honest Joe and it is rather fascinating. There are, of course, many programs to do with horse-racing and betting on the gee-gees, but this is literally from the other side of the fence. It can be played by between 1 and 4 players and either the single player or numbers take the part of bookmakers. Each game is made up of four race meetings held at different courses in England, and each meeting consists of 4 races of varying length. Each race has 10 runners of varying stamina competing in each race. In the second and subsequent meetings, new runners may compete, but old runners will appear in different combinations. A runner's stamina, history and the length of the race all have a bearing on the outcome of each race. Essentially the player has to manage a book. He must set the odds, accept the bets and, hopefully, come out ahead. One of the things that help him are reports from major sporting newspapers which are given in respect of each race. Three rather nice examples are:

''A trainer was overheard in the Nag's Head at Doncaster to say that Whizz Kid would not be trying very hard...''

''Over a few pints of Guiness at the Broken Bridle yesterday a stable lad was persuaded to tell our reporter that Maple Leaf was suffering from a dislocated fetlock.''

''Patchy has not been seen training recently, and is rumoured to be suffering from equine haemorrhoids.''

As we said, Mr. Campbell has a fertile imagination. The racing, incidentally, is on the flat. The sequence of play is that at the start your financial statement is given, together with any tips available. You are then given the stop press news, that is to say, the comments noted above, the race card follows with the 10 horses taking part and their stamina, whether they have run any races previously in the session, the number of races won in the session and the number of times that the horse has been placed second or third in the session. The player enters whatever odds he wishes and random betting is then made by the computer. Everything is then set for the race, and quite a thrilling commentary is displayed on the screen, culminating, of course, in the winner and the placed horses. Details of payout and the amount of cash bet follows after the race and the financial details of how you, as a bookmaker, made out. The amount of cash bet on each race can be regulated by the bookmaker in precisely the same way as an ordinary bookmaker does, namely by restricting or opening the odds. The lower the odds, the lower amount of money your customers will bet. All in all, we feel this is a realistic simulation and good fun to play. Although supplied on cassette, it seems to be compatible with disk Basic.

ASTROBALL — AN OFFSPRING OF PINBALL

Astroball is written by the same author as Pinball which we have carried for some time (see page 33 of the catalogue). We have always been keen on Pinball, thinking it to be the best of the two or three pinballs there are for the TRS-80 and Video Genie, but John Allen seems to have bettered himself. The simulation is still fairly similar, but there are lot more moving targets in Astroball than there are in Pinball. The excellent simulation of the pulling back of the plunger to start the ball rolling is continued in Astroball, that is to say, the longer you hold down the space bar the more force the ball has when it is launched. The flippers, of course, are retained and they are slightly larger. The speed of play is a lot faster. There are now five skill levels and if you choose the fastest it is very hard to control the ball at all. The scoring is similar to the previous version, but there are now bonus points. If these are earned they are added to the score

at the end of the game and if double or triple bonus targets are hit the bonus is doubled or tripled before being added to the score. If you are sufficiently skilful to hit both the double and triple targets then your bonus score is multiplied by six. Space ships move across the screen continuously and if you hit them you will get a bonus of 90 points. There are meteors and asteroids and perhaps most importantly, a black hole into which you can quite easily disappear. Sound is, of course, available. All in all, an extremely good pinball program.

LABELLER — USE LABELS IN BASIC

One of the great drawbacks of Basic is that it is line number orientated. In other words, the only way that one can reference a statement is to reference the line number containing it. The inconvenience of this is obvious, namely that one has to know the line number before constructing a GOSUB or GOTO statement. A lot of people have gone some way to getting over the problem by habitually using the same line numbers for subroutines, but even so no hint as to the content of the subroutine is given by the calling statement. If, for instance, one has a subroutine that carries out some sort of test, then it can be placed in a particular line, and at the end of that line a REM statement can be inserted explaining the purpose. It is far easier if, as in assembly language, one can allocate a label which itself goes some way to describing the purpose of the subroutine. In the example given, for instance, a label simply entitled ''test'' would give an indication of the purpose of the subroutine if it could be inserted in the calling statement. In other words, instead of the statement GOSUB 2000, one could state GOSUB TEST. A further advantage is that the subroutine line does not have to be allocated when the calling statement is composed. Hence, throughout the program, the statement GOSUB TEST can be inserted with the programmer knowing what he has in mind, but not actually writing the subroutine until some time afterwards. This program permits the use of labels in disk Basic programs. Furthermore, labels can be inserted in existing programs by editing them in. The label reference consists of 1-6 letters or digits, of which the first must be a letter. The label must not contain a Basic keyword. Thus, for instance, LOOP1, LOOP2 are valid references, but NEXT would not be because it is a keyword, nor would DONE because it contains the keyword ON. The label reference may replace any line number following a GOTO, GOSUB, THEN, ELSE or RESUME. A particularly nice feature of the program is that line numbers and label references may be freely mixed. Thus, ON X GOTO TOM, DICK, 2000, HARRY is valid. The program will, incidentally, distinguish between label references and variables having the same format. The label is inserted in the line preceded by @ and followed by a colon. Thus, 5000 @TOM:... is the general syntax. After the program has been written as described above, it is saved to disk and then delabelled by the use of another utility supplied. This goes through the target program, removes the labels and substitutes line numbers. Thus the resulting program is normal, but the user has the advantage of using labels. There are three switches. One will remove all spaces from the program, except those in remarks and quoted strings. The second will remove all remarks unless a line contents only label and a remark, and the third suppresses the output file so that a test run may be made to find any errors before the output file is written. A very useful utility for the busy programmer.

HORACE — A HORSE RACING GRADING METHOD

It is perhaps a sad commentary on the state to which some laws have got into in this country that, because of the various consumer acts, we find it necessary to remind customers that this program is intended as an aid to picking the winners at horse races. In no way do we guarantee that it will work, nor that any user will become the richer because of its application. What it does do is to represent a genuine attempt at cutting an intelligible path through the mass of information presented by the sporting press in the guise of form. Even with this, however, it must be borne in mind that there are literally as many ways of interpreting ''form'' as there are horses. It is probably fair to say, however, that if this program is used intelligently it will aid in the picking of winners at various horse races, and everything else being equal, a person using it would probably stand more chance of winning than a person who did not. Incidentally, the user will require a copy of either The Sporting Life or The Sporting Chronicle in addition to the software. Racing form, to the average punter, usually involves little more than a cursory glance at their favourite newspaper columnist's selection. Some go a little further and look at the betting forecast. Tipsters very frequently come up with different tips for the same race, so even this method is somewhat unreliable. It is punters who place money on horses on the basis of the foregoing that provide the majority of the income to the bookmakers. At least Horace will aid in a more scientific selection. It is a truism that with or without Horace you can rarely beat a bookmaker, but the use of Horace, combined with caution and intelligence, means that you do stand a better chance of relieving the bookie of other punters' money. What Horace does, essentially, is to remove most of the thinking from you as, perhaps, an inexperienced punter. It will present you with a reasoned assessment of form based on the one factor that most punters ignore, namely value for money. The main points considered by Horace are: —

The type of race
The prize money at stake
The state of the going
Where the horse last raced
The weight carried then
The location
The distance
The odds available
When the horse last raced
The weight carried now

When the user elects to use Horace as an aid to the selection of his horses, he must understand that he will have to input a large amount of data to be obtained from the newspapers. There is no way round this. It is not practicable to keep the data on file for every horse that has run in England, and in any event, circumstances are entirely different for every horse meeting. Indeed, if these facts were not so, there would be no point in having Horace, nor, for that matter, would there probably be many bookmakers in business, as if it were possible to do what we have suggested, the results of most races would be a foregone conclusion. However, once all of the information is inputted to the program, Horace will project the first three past the post, together with some other rather important information such as the related decimal chance, the value odds acceptable, the betting forecast chance, the expected starting price and the cash class. Horace is an extensive program, but the foregoing should have given some indication of its general purpose. Two versions are supplied, one for the flat and one for the National Hunt. Finally, it must be borne in mind that the form rating projected to Horace is entirely confined to the race under scrutiny. It is purely a measure of the horse's merit in relation to its companions in that particular race.

COP16K — SYSTEM PROGRAM DUPLICATION

We have for some time past stocked a program called COPSYS from Racet. It is described on page 7. Although that program is an extremely good one, it does suffer from one great drawback in that because it occupies memory itself, it can only duplicate machine language programs to about 14½ K. This program essentially carries out all of the features of COPSYS with the addition of one or two functions including the ability to copy a full 16K. Additionally COP16K will copy non system format tapes which include EDTASM source tapes, Basic programs, Basic data tapes and non system machine code tapes including many with trick loaders. COP16K allows for the choice between cassettes 1 and 2 so it is of increased value to the Video Genie owner. The program is menu driven as follows: —

1) Toggle Cassette

   The program starts with cassette no. 1 selected. The cassettes may be toggled, that is to say, alternatively selected with this command.

2) Load System Tape

   This is self-explanatory. When the load is successful the file name of the tape will be displayed on the screen and the user is also asked whether or not additional tapes are to be loaded. It is therefore possible to join together any number of utilities which the user wishes to load into memory at the same time in a single load. Tape loading and checksum errors are carried out during the load.

3) Load any 500 Baud Tape

   Again this is self-explanatory. No checksum is taken in this mode for the tape may not contain one. If the user feels that he is getting a bad load then the tape can be switched off and COP16K will assume that the data is finished and will automatically return to the menu as it does after each non system load.

4) Verify Buffer Tape

This command can be used to verify both loads and writes. This option verifies according to the format of the program in the buffer.

5) Write Buffer to Tape

With this command the contents of the buffer are written to tape in the same format in which it was loaded.

6) Jump to 16K Duplication

For most applications of loading system tapes the second command listed above will carry out all that is needed. Occasionally, however, one comes up against a tape which occupies the full amount of memory and it is for this type of software that this command was included. Most long machine code programs will write over the facilities of this command, thus there is no return to the main menu. When this option is selected a mini menu is displayed consisting of four commands, Load, Verify, Write and Basic. The first loads a system format tape into memory. When loading is completed the user is returned to the mini menu. Checksum and tape load errors are checked. If one is encountered the appropriate error message is displayed. The Verify and Write commands are self-explanatory and the final command of the mini menu, Basic, returns the user to a cold system boot. This program is for 16K TRS-80 or Genie owners only.

SAUCE — A DISASSEMBLER FOR THE MODEL II

This is a full feature Disassembler intended to complement Edit-80 and Macro-80 originally written by Microsoft, but published by them and by Tandy under various names and in various packages. Sauce can be used to disassemble any program, that is to say, non system file, and will produce a source file on disk which is compatible with Edit-80 source files. The purpose of this compatability is to enable a user to disassemble a program that does not exactly fit his needs, adapt it as necessary and then re-assemble. Sauce has an extremely full range of commands and is extremely versatile. Any part of the target program can be listed to the screen or to the printer. The user may also jump to examine any part of the program. Two further user convenience commands are the ability to clear the screen without, of course, losing the program heading, and a function to send a form feed to the printer. There are commands to enter labels into the program and to determine whether an area should be disassembled as Z80 instructions or as DB, DW or DS expressions. The labels or controls already used may be examined by dumping them to the screen or to the printer and even comments can be added to the program. This is particularly useful when one is examining a program and discovers what a particular section of it is used for. Editing, in other words, deletion, of labels, controls and comments is permitted. A search command allows the search for a hex string in the target program and lists such addresses to the screen. Two particularly powerful features of the Disassembler are firstly its ability to determine the DB expression areas in the target program itself, and secondly the automatic allocation of labels, in other words, a two pass Disassembler. In addition to being able to save a disassembled file, the user may also save the ''State'' of the Disassembler at any time. This has particular application when investigating a long program because it enables the user to carry out his disassembly or investigation in more than one session. The Disassembler display is, we feel, particularly good for this type of utility. An example is given below.

```
→ SAUCE Disassembler Program Version 1.0                    July 1981
→
→Program  : 3000-4124    Controls : A000-A120    Program Counter  : 301C
→Symbols  : 8000-8201    Comments : B000-B312    Transfer Address : 3344
→*P3000
→      LD   (40BBH),SP              ;3000    ED 73 BB 40    .s.@
→      LD   SP,426EH                ;3004    31 6E 42       1nB
→      LD   HL,-1                   ;3007    21 FF FF       !..
→      LD   (0A000H),HL             ;300A    22 00 A0       ".
→      LD   (8000H),HL              ;300D    22 00 80       ".
→      LD   (0B000H),HL             ;3010    22 00 B0       ".
→      LD   A,'I'                   ;3013    3E 49          >I
→      LD   (9FFFH),A               ;3015    32 FF 9F       2..
→      LD   IX,8000H                ;3018    DD 21 00 80    .!..
→*
```

The title is shown in reverse video and, as you can see, contains the current program information. In this case you can see that the target program appears to be stored at 3000 hex to 4124 hex. In this case no offset is necessary as the program is actually stored at 3000 hex anyway. You can see that some controls, symbols and comments have been entered, but that none of these are in danger of overflowing their respective areas. Having listed the short section of the program, the program counter is now set to the start of the next line, which starts at 310C hex. The transfer address for the program is at 3344 hex.

DIFFERENTIAL EQUATIONS — DIFFERENTIAL EQUATIONS WITHOUT TEARS

Elsewhere in this catalogue you will see described a program called Tables written by Mr. J. M. Heath. That piece of software adopted a free and easy attitude towards teaching young children their mathematical tables. Mr. Heath has now directed his talents for writing highly interactive programs to the problem of differential equations. These mathematical equations rear their heads in a surprising number of different professions and walks of life. Indeed, in describing that, we have used the word ''different'' and that is the difference between matters that give us cause to use differential equations. Extremely accurate numerical methods of solving differential equations are available, but they are relatively unknown to the general populace. It is in number crunching, however, that a computer shows its real qualities and full advantage has been taken of this in the composition of this program. Moreover an extensive manual is supplied with it, again written in Mr. Heath's friendly style. Obviously the purpose of the program is to solve differential equations and to teach people how to do so in the most painless way possible. The program will handle up to six first-order equations in six variables. Almost any practical problem which comes up is already such a system or can be reduced to a system of this sort. For those customers who are acquainted with mathematics, at the core of the program is a fourth order Runge-Kutta method. The global accuracy of this method is remarkable. The accumulated error is roughly proportional to the fourth power of the integration step size, far superior, so the author tells us, to the modified EULER method. Apparently the Runge-Kutta iteration is used extensively in numerical analysis programs available on main frame computers. The only criticism we have of the program is the method of inputting some data. Although this is properly and completely prompted in the program, nonetheless it is necessary to edit some lines in order to enter the details of your equations. We do not wish to overplay this, it is fully explained in the manual, it is easy to carry out and may have one advantage in that when one has to enter data in this way, perhaps one is thinking a bit more solidly about it than when using other methods. The manual, after an introduction, takes the user through the use of the program, discusses the number of equations and how they are entered in. Initial values are discussed fully. If the user is in any doubt after reading this section, there follows an exhaustive illustration of a sample program session including some general tips. A final section covers further hints and tips with boundary value problems, solutions over long ranges of the variable 't', printing the results for more than three variables and saving equations to disk. A provision is made for the output of a graph of the results and a line printer is supported throughout.

SYSTEM DIAGNOSTIC — A COMPLETE TEST FOR MODELS I AND III TRS-80

This is a major new program from Hubert S. Howe, the author of the Monitors which we stock and also the book, ''Machine Language Programming from the Ground Up''. It should be differentiated from his previous Diagnostic which merely tested RAM, to some extent the Video drivers, and ROM. When he named this program System Diagnostic he meant exactly that, the whole system of either of the two computers mentioned are tested in a rigorous manner. The program is, to some extent, compatible with the Video Genie both Models I and II. There will, however, be some obvious differences. Whenever these come to light we will add an addendum to the manual for the program. Video Genie owners should order the Model I version of course.
The individual tests carried out by System Diagnostic are as follows: —

ROM

System Diagnostic does a normal ROM check, that is to say, it goes through the entire ROM and carries out a checksum. If this checksum corresponds to those known for the machine in question then that particular specimen of the machine passes the test. The ROM check is very fast and only takes a split second to complete.

RAM

There are three RAM tests in the Model III version of System Diagnostic and four in the Model I. The three which apply to both are as follows: —

1) Non Destructive Test

   This test checks location in memory, but restores it to its previous value before continuing, so it does not destroy the contents of programs or data which may be stored there. The non destructive test provides the only method of checking low RAM, below the program itself, where system pointers and other important values are stored. This test runs very fast and should finish in only a few seconds unless errors are encountered. Any major errors due to a defective RAM chip will be discovered in this way, but intermittent errors, which may happen occasionally, but not always, may not show up whilst the test is in progress.

2) Complete Test

   The complete test stores each possible byte value from 0 to 255 in memory, waits, and then tests it to check for the correct value. This test is only carried out for high RAM, that is to say, from the end of the program to the end of your memory, as the previous contents of the memory cell are lost. Each value currently being tested is displayed on the video display and running the complete test from start to finish takes several minutes. As mentioned, this test will destroy the previous contents of memory, and as this Diagnostic is also capable of testing the printer, as we shall see in a minute, the user may require to have resident in high memory a driver for the printer. Consequently the provision is made whereby a lower memory value than is actually resident can be specified for the test so that the driver or whatever is stored in the memory above that stipulated, will not be damaged.

3) Refresh Test

   This test checks the TRS-80's capability of properly refreshing the data stored in dynamic RAM. Although it is not necessary for the average user to understand this particular test, it may be advantageous to quickly explain the reason for it. There are two practical types of memory integrated circuits used in microcomputers. They are called either Static RAM or Dynamic RAM. The latter are cheaper for the equipment manufacturer to buy than the former. The actual memory cell may be considered to be a two way switch which can be either ''on'' or ''off''. Most cells consist of what is called a flip-flop which is an electronic circuit, the output of which is either in a high or a low state depending on the setting of the flip-flop. The point is that in Static RAM, once the flip-flop is triggered it will change state and stay there without any outside intervention at all, until a new data pulse comes along. The Dynamic RAM, on the other hand, will not, unless it receives what is called a refresh pulse from the CPU. Consider the dynamic memory cell as an infinitely small battery which has to be charged (refreshed) every so often to maintain its voltage level (data). The Z80 CPU used with the microcomputer is well adapted to Dynamic RAM because it generates a refresh pulse itself. If this refresh pulse does not come along to the Dynamic RAM within a certain specified period, then unpredictable results can occur, including the loss of data. As previously stated, this test checks the machine's capability of properly refreshing the data stored in the Dynamic RAM. So far as is known, System Diagnostic is the only program which carries out this test.

The one test on RAM that is available in the Model I version of the program that is not available in the Model III is what Hubert Howe has called the ''Glitch'' test. Again this is thought to be an entirely new type of test for TRS-80 Diagnostics. It takes a checksum of your RAM and then runs through a series of operations that simulates the starting and stopping of other peripheral devices. At the end it repeats the checksum to see if it is the same as before. If not, then an error is indicated. If this test is run whilst household appliances or other outside electrical equipment is being run then the user should be able to see the effect of this equipment on the machine. If the test fails it is fairly certain that the equipment in question is causing transient spikes which will affect your computer. Both the Glitch and Refresh Test require an Expansion Interface.

Video Display

This test consists of the following checks: —

1) Character Generator Test

   The character generator test prints all available characters on the video display, including, in the case of the Model III, the special character set. The first four lines display the print characters, the next two lines the graphic characters and the last two lines the special characters. They can be inspected by the user and if any character is not correct or is missing a dot or whatever, then the video character generator in the TRS-80 is probably defective. The alternative character set in the Model III — the Japanese Kana character set — can be displayed by returning to Basic, carrying out a command and going back to DOS for the Diagnostic.

2) Video RAM

   The video RAM test very rapidly fills the screen with each possible character that can be displayed on the TRS-80 and then checks it for accuracy. This procedure tests the accuracy of each character in each position of the video display. If there is no problem then the test immediately goes on to the next value, completing the entire test in about five seconds. If there is an error a message is displayed and the computer waits for about a second and a half before going on to the next value. This is so that the user can scrutinise the incorrect values and see what is wrong.

3) Video Signal Test

   The video signal test fills the entire screen with a graphic block. This display should have fairly straight edges, there should be no bending or wobbling of the sides. If the two vertical edges are not straight or weave back and forth, it will indicate some sort of problem, possibly transient line voltage problems. Large distortions of the edges could indicate a serious problem with the video opto isolator board.

Keyboard

The operator will have to assist the computer in carrying out this test by pressing down each key as instructed and holding it down as long as the test remains in effect. This procedure will test the leads from each key on the keyboard to the proper location in keyboard memory. The process of holding down the key tests for intermittent failures which will be observed if the contacts are partially shorted. This test also checks the keyboard memory.

Line Printer

The line printer test is similar to the video character generator test. It prints a line of 64 characters of each of the 95 legitimate ASCII characters in the character set of most line printers. The characters that will be printed are the same and in the same order as with the video character generator test. It produces special characters, numerals, upper case letters, lower case letters with additional special characters at the end of each group. The operator visually inspects the results of the test for errors.

Cassette Recorder Test

There are two cassette tests, one for writing and one for reading cassette tapes. In the Model III the user is given the option to choose high or low speed. The write test creates 16 blocks of data, each containing every possible byte value. These are written to the cassette, preceded by the leader and sync bytes. Writing takes about one minute and fifteen seconds and it may be repeated several times on a single cassette in order to check the reliability of the cassette. The read test, of course, reads back the cassette created by the write test and verifies it. One by-product of these tests is to discover the operating range of your cassette recorder. The tests can be repeated at different volume levels until an optimum level is achieved. Another application of this test is to check the actual media itself for drop-outs in the recording level. Obviously it would be too time consuming to carry out this test on every cassette that one is going to use, but it may be well worth while to carry it out on cassettes which are going to be used for critical applications.

Disk Drive

The disk drive tests are particularly thorough and perform all of the important tests that can be carried out on disk drives short of taking the drive itself apart. There are seven different types of test as described later. The manual which is supplied with this program is some 28 pages long and about 8 of them are taken up with a fairly in-depth explanation of how the disk drives and their controller operate. A lot of information is taken from Dr. Howe's book, but Model III customers will be particularly interested in this section as very little information has been available to date on the disk operation of the Model III. Customers owning Model III's may well consider that this information is a very important plus when considering whether or not to purchase the program.

1) Drive Select and Disk Controller Functions

   This test is designed to check the functions of a disk drive except for the reading and writing data. It should be the first test attempted on a drive whose operation is suspect. Firstly, the drive is selected and a restore operation performed. The status register is checked for various conditions and step in and step out operations are performed.

2) Track Seek and Verify Read

   The track seek and verify read test reads and displays the contents of every track and sector on the diskette. Following the disk start up test, a seek command is issued for track 0 sector 0. Each time a track is located, all sectors are read and displayed in order. This test permits stepping rates from 3-15 m/s. This may cause problems and a failure of the test with some Teac Model III drives which are set to 30 m/s. Only 35 and 40 track drives, incidentally, are supported on all disk tests, although this is not necessarily any great problem. The 256 bytes read from each sector are displayed in ASCII code along the bottom area of the video display. During this test many different kinds of errors are checked, but not all of them will result in termination of the test. Seek errors, CRC errors and lost data errors are simply counted and a running total is displayed if they occur. More serious errors such as track not found or drive not ready will cause the test to be aborted. If you specify a seek time faster than your disk drive can tolerate, as, for instance, may occur on some Teac drives at 15 m/s, you will get some of the errors mentioned above. Actually this test is quite a good way to discover the limitations of your disk drive.

3) Formatting

   The formatting test is designed to allow you to discover the formatting characteristics of a particular diskette. Since it uses the read track command to read an entire track of data at a time, it can handle non-standard diskettes. A Model III version of the program will only handle double density diskettes, whereas a Model I will only handle single density. The formatting test reads each track from the diskette in order and displays the following information read from the ID field: track number, sector number, sector length and checksum bytes. The data bytes themselves are skipped, but the DAM (Data Address Mark) and data block checksum are displayed.

4) Read/Write/Verify all Sectors

   This test is self-explanatory. It writes then reads and compares each sector of the diskette with a byte pattern.

5) Read/Write/Verify without Erasing

   This is similar to the above test except that the contents of the diskette are not destroyed in the process.

6) Disk Drive Timer

   This is one of the most important general maintenance diagnostics that can be performed on your disk drives and again as far as is known, with the exception of one particular dedicated program from Racet which only tested certain types of drives, this program contains the only known test for this possible malfunction. The speed at which the diskette turns within the drive is supposed to be 300 revolutions per minute. Variations of up to 1.5% are acceptable, but above that limit errors may well begin to occur. This test will tell you the exact speed of any particualr disk drive in RPM. The formatted diskette is inserted into the disk drive and the Enter key is depressed. The speed is then displayed and continuously updated as the diskette turns. The display is given both in numerical and graphic form.

7) Disk Head Cleaner

   This test merely activates the drives. The operator has to supply the diskette cleaner and fluid. Normally when one cleans one's drives it is necessary to fool the drives into doing something, usually by calling a directory. This test merely takes the place of this subterfuge.

RS-232-C Interface Tests

These tests are slightly different with the Model I and Model III. The principal difference is that with the Model III version there is an option to initialise the interface with the usual parameters, baud rate, word lengths, parity etc. These, of course, on the Model I, are set with dip switches. The following tests, however, are common to both models.

1) Connector Test

   One of the bugs of the RS-232, particularly on the Model I, is the connector between the interface board and the main board. This test will check all connections.

2) Transmit Data Test

   This test initialises the UART and then attempts to transmit data. If the UART status register indicates that the data was received, the test passes. If not, the test continues to attempt transmission.

3) Framing Test

   The framing test is a check of the relation between the stop bits and the data bits. A framing error indicates that a spacing error was detected when the stop bit period should have been occurring.

4) Data Loop Test

This test continually sends a stream of data to the RS-232. The verification is accomplished by visually inspecting the data which will be echoed by the video display when accepted by the output of the UART.

5) Baud Rate Generator Test

This test resets the baud rate generator at each of the 8 most commonly used baud rates.

One of the most important features of this program is that it has the ability to run the above tests continuously. As many of you will know, probably the most frustrating occurrences with a microcomputer is what is called an intermittent fault, that is to say a fault of whatever nature, that occurs only at certain times, whether that time is set up by outside influences or not. Probably the most common occurrence of an intermittent fault is when it is related to the temperature of the equipment, that is to say, how long the machine has been switched on. The ability to continuously test in cyclical fashion without user intervention can show these faults up quite conveniently. The keyboard, line printer and cassette tests are not included in the continuous test for obvious reasons. The program is, as is obvious from the above, compatible from either cassette or disk machines. As a matter of expendiency it is distributed on a 500 baud cassette, although customers preferring to pay the disking charge may, of course, do so. Model I and Model III versions are different so the model used must be stipulated.

HEXSPELL — A WORD PROCESSING DICTIONARY

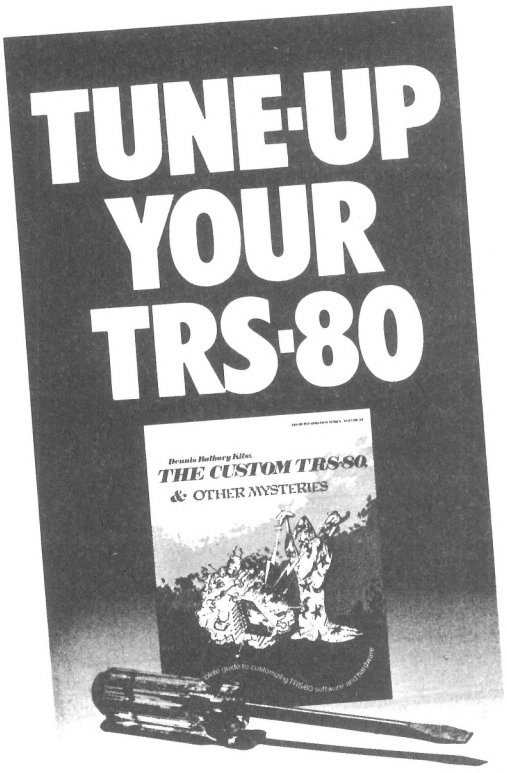
Now that word processors are becoming so widely used, a system whereby the spelling of letters and documents can be automatically checked is well nigh an essential item. It has been proved time and time again that the author or the typist of a long and possibly complex document can search that document many times with their eyes and still not see the most obvious mistake. Hexspell is compatible with all word processing systems of which we are aware, including Scripsit, Electric Pencil and AJEDIT. The latter is a new word processor described in this listing. Essentially the program goes through any file produced by the word processor and checks each word against a self-contained dictionary. In the case of Hexspell, this dictionary consists of about 23,000 words in store on disk and another 6,000 words continuously held in the computer memory for fast access. A very nice feature of the software is that the most commonly used words of any particular user are continually ''sifted'' towards the top of the list and hence put into memory on power up. In other words, the program learns which words are used most commonly by any particular operator and makes sure that these are in a faster access area. The program can, of course, be instructed to learn words and such words will be added to the dictionary. When the program is first fired up it asks for the name of the document file and when this is provided it asks for the name of a work file to be used. The program now queries whether or not the user wishes to check words containing upper case. Usually, of course, the answer to this is in the negative because most words containing upper case are names containing just the first letter as a capital. Each sentence also starts with a capital, so by ignoring the upper case the amount of checking is considerably reduced. The program will now continue by starting to check the actual text. This is scrolled from the bottom of the screen upwards at a fast reading rate. This is a particularly important point in the context of the capitals being ignored. Any capital letters stand out, of course, so the person supervising the run can check these visually as the script goes by. When an unknown or mis-spelt word is found the program will stop, the word will be shown on the screen together with continuation words that follow the word in question. Again this is quite an important point as it gives the context of the phrase which sometimes has a bearing on the actual spelling of the word. The user may now either replace the word, in other words, correct the error, leave it as it is, or instruct the program to learn the word for future use. When the choice is made the instruction is fulfilled and the program goes on to the next word that will cause it to stop. One of the concerns with this type of program is the small differences in American and English spelling. With Hexspell this is not a difficulty, partly because there are not so many because it was written by a Canadian, but mainly because words can be deleted from the dictionary and new ones added. Thus if there is any spelling which is not as the user likes it, that word can be deleted and a word spelt as he wishes it inserted. A utility is added to Hexspell which will clear the dictionary of all words. It is not likely that this will be used often, but it may be of use to people who wish to construct their own dictionary say in a foreign language or a particular profession. A new version of Hexspell has been issued by Hexagon Systems which contains a major enhancement. This is the addition of a control file which enables the user to customise Hexspell 2 to his own particular requirements, in particular he can define the meaning of a ''word'' in the context of his business or profession to include such things as part numbers, product codes or even formulae. So far as is known, Hexspell 2 is the first dictionary program on any microcomputer to include this powerful feature. Present owners of Hexspell may update to Hexspell 2 for the difference in price. As the original Hexspell will now be discontinued, it should be noted that its price will not appear in the index from now on, but it is £39.00 plus V.A.T. making a total of £44.85.

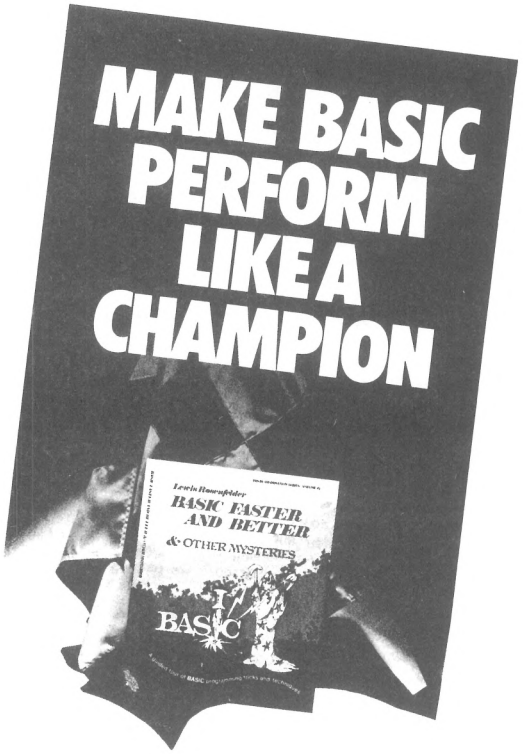
BLACKJACK MASTER — A SIMULATOR/TUTOR/GAME

The first thing to emphasise about this program is that although it does contain a program to play Blackjack with you, it is not simply a game. It is an in-depth study of the strategies of playing Blackjack (or, if you prefer, Pontoon). Many claims have been made purporting that this or that strategy in the playing of the game is the best. Whether there is such a beast is of some doubt, but if there is a best one, how does the average Blackjack player, or indeed an expert Blackjack player, evaluate the various strategies and make a reasonable decision on the best strategy for him? First of all, the serious player must decide on which strategy is best for him and then (if he didn't have a computer) go along to the casino and probably lose an awful lot of money to find it is not the best strategy. A computer is ideally suited to a task such as evaluating a strategy. It can ''play'' millions of hands and extract therefrom the best.
The program consists of three separate, yet interrelated components for learning, developing and playing various strategies. The first of these components is the simulator. Its function is to ''simulate'' the playing and betting strategies that you enter into the computer and then record the results for future analysis. The simulator is a table-driven processor whose main input is from five playing strategy tables and four betting strategy tables. Since table-driven programs are easy to modify, the logic of the program never has to change, just the table values. The second component is the tutor. Its function is to let you practice the strategies you designed during simulation. This program is also table driven and uses strategy tables to evaluate your decision for a hand combination. The third component is the game module. It plays a total Blackjack game incorporating every facet of the casino game including hitting, doubling, splitting, betting, insurance and surrendering. The game module deals the cards, verifies player's decisions, manages player's money, plays the dealer hand according to casino rules and controls the graphic game display. This component does not require external decision input and, therefore, driver tables are not required. All logic is performed internally and does not interface to any other component.
If you wish to study the game of Blackjack, whether or not you are going to put it into practice, then this is an excellent program for you.

NAPOLEON — A WAR GAME WITHOUT JOSEPHINE

We are often taken to task over the amount of space that we give to the description of a program. Some customers seem to be firmly of the opinion that if we give little space we have not considered the program or think little of it. We would like to emphasise again that this is not necessarily so. Human nature being what it is, it is probably true on some occasions, but some programs such as this really require very little explanation. After all, once you have said that the program is a war game, apart from describing the scenario, there is very little that can be written about it. So to get on with this particular program, Napoleon is a war game that takes place in Europe with the starting date of June 1798. You are playing the part of the Emperor Napoleon of France and you have at your disposal six French armies. With these armies you are expected to conquer the whole of Europe. The computer, of course, will control the moving, finances etc. of the allied armies which consist of Austria, Britain, Prussia, Russia, Spain and Portugal. The player has until the end of 1815 to complete his task. Whenever an army is below 1,000 men strong, it ceases to exist. The British armies start off from either Iberia or Prussia, the other allies start from their respective countries. The graphics, with the map of Europe, are of good quality and there is very little else to say, except that it might be mentioned that it is written by Simon Ford and not Dr. Bodley-Scott so undoubtedly it has a fresh approach to computer war games. The program appears to be compatible with disk Basic.





You may have seen the two advertisements above in the American magazines. They are, of course, the next two books in the ''Other Mysteries'' series. The first two were ''TRS-80 Basic and Other Mysteries'' and ''Microsoft Basic Decoded and Other Mysteries'' which are shown elsewhere in this catalogue. In typical American fashion the Custom TRS-80 book was advertised first, but will not be available until late November. The ''Basic Faster and Better'' is now in stock. Although we have only had the book in stock a few days as this listing is being prepared, we have found it to be one of the most informative books on the ''non-standard'' use of Basic that we have seen. The book is made up of hundreds of hints and tips, the majority of which are supported by short subroutines. The majority of these subroutines are in Basic, but some are in assembly code. It is really rather hard to describe the book because what it sets out to do, and succeeds in doing, is to enable an average user to get far better application out of his Basic Interpreter. If you are curious about all of those little known facts of Basic and in particular the Basic Interpreter utilised in the TRS-80 and Video Genie, then Basic Faster and Better will prove to be a veritable goldmine to you. As a matter of fact the subroutines listed in the book are so good that they have been amalgamated onto two disks. At the moment we are not stocking these because they are moderately expensive with the dollar as high as it is at the moment and we feel that customers may prefer to enter them direct from the book. If, however, we get enough call, we will stock them. Although the book is arranged in chapters, of course, it tends to cover quite a lot of area and it is literally impossible to describe its contents completely. If one had to sum it up, then, I suppose, the best way to describe it is that it is 288 pages of Hints and Tips. An extract from the contents pages is shown below which should give some indication.

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XPRINT — HARDCOPY LISTINGS OF BASIC PROGRAMS

This program allows the user to generate neatly formatted hardcopy listings of the Basic programs from TRSDOS. This may not seem to be a particularly startling thing, but the heart of the value of the utility is a concept called Ambiguous File Specification. An AFS is a shorthand means of describing a group of files to be processed as a single entity. The AFS consists of up to three components: an Ambiguous File Name, an Ambiguous File Extension and an Ambiguous Drive Number. What all of this really amounts to is taking the wild card theory to its ultimate thus one can specify all files starting with a 'T' merely by setting T*. TEST* would refer to all files starting with the letters TEST. T*A* would refer to all files starting with a 'T' and having an 'A' in the third position. Much the same principles apply to the File Specification Extension and Drive Numbers. An AFE of /B* would process files with extensions that start with the letter 'B'. A:* would process files on all drives. It can be seen, therefore, that using this AFS in conjunction with the ability to print listings of Basic programs from TRSDOS enables the user to define and printout such listings with great ease.

PENCIL PATCH — THE ELECTRIC PENCIL ON THE MODEL III

It seems that when God made this earth he decreed that there should be two types of people, ''Scripsit people'' and ''Electric Pencil people''! We have always supported the Scripsit program from Tandy, but in so doing have always understood that there are other people who prefer the Electric Pencil! The Electric Pencil is not yet available for the Model III and hence this program has been produced which will patch the original Model I Electric Pencil so that it will run on the Model III. It should be emphasised that it is the original Michael Shrayer Electric Pencil, the disk version for the Model I, that is to be patched. Other versions, particularly of course for other microcomputers, would not work. The Electric Pencil program is not supplied with this patch so only owners of that program should purchase the patch, as otherwise it will be useless. The patch automatically produces a program called PENCIL3/CMD which has all of the features of the original. There are, of course, one or two small differences, for instance, it is not necessary to have a hardware fix with the lower case as it is already built into the Model III. Line printers are addressed through ROM so all standard TRS-80 line printers are supported. The TRS-232 driver in the Model I version is not available. It might be possible to run PENCIL3 with a serial printer requiring the 232 port, but we are in no position to support the same. The R, W and V commands work in the same way on PENCIL3 and as all tapes are written and read at 500 baud, tapes made on the original Model I version will be compatible with PENCIL3.

80 TRACK — DOUBLE DENSITY — DOUBLE SIDED DRIVES FOR THE MODEL III

What must be the ultimate in drive capacities is shortly to be unleashed by Cumana on an unsuspecting Model III population. We have now done considerable testing on these Teac drives and must say that they come through with absolutely flying colours. We have not had the slightest bit of difficulty with them and they made a very close marriage with the LDOS operating system. The beauty of this configuration is that LDOS considers double sided drives to merely have longer tracks, in other words, on the Model III where the track normally has 18 sectors, with double sided drives it has 36. This is a far better arrangement than other operating systems which call the sides 'A' and 'B' and so on. We literally had to do nothing, either to LDOS or to the drives, we simply took an 80 track normal LDOS, put it in the new drives, told it to format in double sided configuration, then backed up and we had a double sided, double density LDOS. It is rather awe inspiring to read the reply to the command FREE. A normal formatted data disk has 710K bytes free and 240 files free. Even with the full LDOS on the disk there are still 618K bytes and 220 files. This means that with two of these double sided, double density drives in the slots of the console, the user has over 1.3 megabytes to play around with.

We have been rather hesitant in recommending double density in the past, partly because we knew that double sided was coming along, but mainly because until LDOS was written there was not really a disk operating system that would handle the higher capacity disks. We tried to use NEWDOS 80 version 2 with these new drives, but we did not have any luck. It seems as if that operating system requires a special cable in order to properly recognise the double sided feature. TRSDOS, of course, is in no way capable of coping with double sided drives. Although it is said that the hooks are already written into the software, I think it will be some time before any patches are made. A comparison of the mass storage cost per byte based upon Cumana's prices are as follows:

	A	B
40 Tracks double density single sided	.19	.26
80 Tracks double density single sided	.11	.14
80 Tracks double density double sided	.08	.09

Notes:
1. Column A is worked out on the theoretical disk capacity of two disks and Column B on the basis of free space with one full LDOS system disk and one formatted disk.
2. Amounts are decimal fractions of a penny, e.g. .19 is close to 5 bytes for a penny.

We have no hesitation in recommending LDOS and the two Teac double density, double sided drives as the epitome of disk storage for the Model III and as we received such a favourable impression we thought it right that we should pass it on to our customers.

AJEDIT — A NEW, SIMPLE TO USE, MODERATELY PRICED, WORD PROCESSOR

The introduction of a brand new word processor is a major event and AJEDIT is without doubt a major program. There are, however, quite a few Word Processors around and most of them are extremely good ones — why, therefore, another? The question is even more pertinent when it is known that we specifically commissioned the writing of it from an author of the status of Denville Longhurst of Enhanced Basic fame. The answer is that user feedback shows that a large number of customers do not need or want word processor programs which require a quantity of training before use. Scripsit, for instance, is an excellent program, but is complex to use; it even comes with a training course on tape. If one operator is dedicated to using the word processor then it makes sense to have her trained, and the more complex the program (so long as the complexity is accompanied by more and bigger functions) the better. AJEDIT has been written for the user who needs a word processor intermittently, say three or four times a week. Its prime design criteria was ease of use — and just as importantly — ease of recollection of its commands which really amounts to the same thing. The number of times we hear from customers that they have difficulty in recollecting the commands of various word processors is amazing. Certainly Scripsit goes some way towards it by supplying labels for the keys, but then this is a bit off-putting unless the machine is dedicated to Scripsit. Throughout the program the commands at least give a hint from their syntax as to what their function is. A very important feature, at least in our eyes, is that the Edit commands of AJEDIT follow very closely the Edit commands in the Basic interpreter, to which we are all so used. Thus, the command to insert is an I, to delete, D, and to take out three letters, 3D and so on. We will come to this in more detail later on. The point to be emphasised at this stage is that AJEDIT was designed from the ground up to be easy to use.

Before we go into more normal word processor commands and functions, it should be mentioned that AJEDIT has a feature included which is not normally found in word processors, that is the ability to Mail/Merge. What this amounts to is that the user can send out personalised letters or forms. Two files are maintained, one with a list of names and addresses together with a salutation for each one, the other with the form letter. When the operator comes to use this function, the address and salutation is called from one file and the standard letter is added to it. A labelling feature is also included. In this way not only can the letter start automatically with the personalised name of the addressee, but also this can be added in the text of the letter. I am sure we are all familiar with these personalised, yet stereotyped, letters.

We will try and discuss AJEDIT in a reasonably chronological order, but it is an extensive piece of software and if we jump around a little we will have to be forgiven. To start at the beginning, AJEDIT is, of course, only compatible with disks and is supplied on that media. It is executed, as it is a machine language program, from DOS in one of two ways. If the file name AJEDIT is typed on its own, then the program will be loaded and executed by issuing the title page and going into the Command mode. It is, however, a feature of AJEDIT that one can, at the same time as loading the program itself, load a text file. Thus the command AJEDIT filespec will load AJEDIT and then load the text file reflected in the name of the filespec. In this case the program goes straight into the Edit mode. AJEDIT may be considered to have three modes, Command, Edit and Text Entry. The mode in which one is in at any given time is clearly shown by the type of cursor displayed. Whilst in Command mode, the cursor is a flashing block preceded by an asterisk and a greater than sign. Whilst in Edit mode, a graphic character is used. It is usually the graphic character shown when the statement CHR$(186) is issued. This is quite distinctive and cannot be missed. The Insertion mode cursor is a flashing character block (143). Needless to say, movement between the three modes is extremely easy.
Cursor movement is, of course, of the utmost importance in a word processor and the sub-commands appropriate in AJEDIT to move the cursor are as follows: —

SPACE	— One place to the right
RIGHT ARROW	— One word to the right
LEFT ARROW	— One place to the left
DOWN ARROW	— To start of next line
UP ARROW	— To start of preceding line
SHIFT LEFT ARROW	— To start of line
T	— To start of line at the top of the screen
B	— To start of line at the bottom of the screen
#	— Displays the first sixteen lines of text
*	— Displays the last line of text
P	— Displays the next sixteen lines
O	— Displays the preceding sixteen lines
F$	— Searches text to find occurrence of string $
F	— Searches text for next occurrence of string $

The sub-commands which edit the text will now be listed, but first we should mention that the Line Overflow feature becomes active when entering text, that is to say, a word which will not fit completely into the space remaining at the end of the line is automatically transferred to the start of the next new line.

ENTER	— Insert a new line of text following the current line
@	— Insert a new line of text preceding the current line
nC	— Change n characters (default n = 1)
nD	— Delete n characters
H	— Hack and insert
I	— Insert
K	— Kill (i.e. delete completely) text to the right of the cursor
nR	— Replace n characters. This actually does an nD then goes to I
Sch	— Search the line for the next occurrence of character ch
X	— Move the cursor to the end of the line to add more text
Z	— Improves intra-line text addition. Wraparound is not supported with the I command as it is essentially a command from the interpreter, hence Z has been added which supplies a synthetic wraparound when inserting.

Note how closely the commands listed above, with the exception of the second one, follow the normal Edit commands of the interpreter. Assuming a person has used Basic before, he could immediately go into AJEDIT and start using the Edit commands.
There are a few special sub-commands of some importance. For instance, it is possible to transfer a stipulated number of lines of text to a special buffer for subsequent recall. When recalling, these lines are inserted following the current line. In other words, a type of scratch pad memory of lines of text. One of the principal design criteria was to incorporate into AJEDIT a degree of "What you see is what you get". In other words, what you see on the screen is what you will get on the printer. It is, of course, impossible to do this completely because, amongst other things, the screen has 64 columns whereas even the smaller printers will have 80. Nonetheless, it was considered of some importance that the screen should always give a tidy appearance, particularly when displaying text, and accordingly a screen justification feature is incorporated. This is optional. It may be switched "on" or "off" at will, but when "on", as the cursor reaches the end of a line and goes to the next, normally, of course, in the middle of a word, then it will carry that word over to the next line and automatically justify the preceding line. It should be emphasised that unless the screen column width is set to 64, then this screen justification feature is merely a convenience for the operator. So that there can be no misunderstanding, when using this feature it is also possible to change a justified line into an unjustified line and vice-versa. It is typical of these commands that they use easily recognisable initials. For instance, justification of the screen is turned on by the letter J and normal listing is turned on with the letter L. The Command mode, which we will consider next, is called with the /. Even this has some logic in that one is going from Insertion/Command.
The principal purpose of the Command mode is to transfer text between the editor and text files saved on disk. Assuming that the program is called less automatic text loading, it is the mode into which you will be put when you enter the program. All commands are terminated with the Enter key which is very convenient in use. We keep on emphasising the ease of remembering AJEDIT's commands and we are about to mention another one. If you have no command then it is extremely logical to enter nothing, but just to hit the Enter key. If one does this, then the effect is to return the user to the Edit mode — in other words, "I have no more commands, let's go back"!
There are a number of dedicated commands which we will list in a minute. If these are not used, then whatever is typed in is interpreted by AJEDIT as a DOS command. It will then go back to DOS, execute the command and return WITH THE BUFFER INTACT. Thus, typing from Command mode DIR causes the program to display the directory of drive 0. Typing FREE will tell you how many free granules you have on drive 0. KILL will kill any specified file. So far as we can see, most commands in DOS will work, particularly the important ones. DIRCHECK, for instance, if one is using NEWDOS, works fine, so it can be taken that almost all DOS commands, except the exotic ones such as DEBUG, will work, even though it is only really the ones appropriate to the directory that one is concerned with when using a word processor. The dedicated commands are as follows: —

L filespec	Loads a text file named filespec. The buffer must be empty before this command is used. If, in fact, it has any contents, the command will be ignored, hence it is not possible to overwrite or erase important data.
A filespec	The text file named filespec is appended to the text already in the text buffer. Control is transferred to the Edit mode.
W	The contents of the text buffer are written back to the disk file named in the L command. This is, of course, used to update the disk file and should not be confused with the next command.
C filespec	The contents of the text buffer are copied to the disk file named in the filespec. This is used to make copies of text and to save new text. It has to be used also to write back a file after the A command has been used.

Of the above four commands, the first two give a return to the Edit mode and the last two to the Command mode.

M	Displays the amount of free memory left in the buffer.

E	Exits, but does a W command first, thus saving the edited text back to disk. The exit is to DOS of course. The automatic calling of the W command means that it is virtually impossible to lose text.
Q	Quit editing, forget all changes and exit to DOS.
X	Allows the text to specify the next program to be run under DOS. The X command first does a W command (just like Exit) then before exiting to DOS the first line in the text buffer is sampled. If that line has as its first characters two non alphanumeric characters (e.g. ::) followed by an asterisk and a space, then the remainder of the line is taken to be a DOS command. The purpose of this command may be obscure in the context of the way in which we have been considering AJEDIT, namely as a word processor. It does, however, have another application in which the X command is important. We will discuss that at the end of this list.
Y	This command is used to tidy up the text in the buffer. After an editing session the text, as displayed on the screen, may look a little untidy. The Y command will tidy things up. As was stated for the screen justification command, it should be emphasised that the Y command only affects the way that text is displayed in the Edit mode. Text is always sent to the printer properly formatted.
N	New. This clears the text buffer completely.
P	This sends formatted text to the printer and to the display. The P command may be disconnected from the printer by adding .NP. This will turn off the output to the printer so that the P command will now send text to the display only. The converse command, .YP, will re-enable output to the printer. As we have not said it for a little while, once again note the use of the initials, .NP = no printer, .YP = yes printer.

We have mentioned that the / key is the method of going from Edit to Command modes; we did not mention that it may be followed by another command. Thus, for instance, / DIR will enter the Command mode and execute a directory command to DOS. To revert to the X command, we were saying that in certain circumstances part of the first line of the text may specify the next program to be run under DOS. AJEDIT may be used to write source files for Microsoft's Macro Assembler, which is also distributed by Tandy, and without the X command it would be necessary to go through the following sequence: E to save the source file back to disk and exit to DOS, then from DOS call the Macro Assembler with that software's rather unwieldy command line M80,EDIT/REL,EDIT/LST = EDIT/MAC. Obviously when this is done time and time again it becomes both tedious and annoying. If the source text of AJEDIT has as its first line the M80 command listed above, but preceded by two colons, an asterisk and a space, then simply using the command X will save the source file, exit to DOS and run the Assembler, fully utilising the command line feature which that Assembler supports. Note the rather crafty way of using the double semi-colon as a delimiter. Assemblers ignore lines starting with a colon thinking they are comment lines.

We will now turn to the text formatter part of AJEDIT. The purpose of this, of course, is to output text to the printer in an entirely controlled manner. The formatter, although completely integrated in the editor program, is in effect a separate program which operates on the text buffer without in any way altering it to produce a printed document. The formatter allows control codes, which control the way in which text is presented in the document, to be embedded in the text. When the first character of a line is one of five symbols, that is to say, a semi-colon, full stop, greater than, plus or minus, then that symbol is not printed in the document, but the code that follows determines the document's format. It is thought that this method of issuing format commands is pretty well standard. It is certainly the easiest to use. Formatting commands will be on a separate line in the text. An extremely useful feature of AJEDIT is that commands which start with a full stop may be linked together into a multiple statement line by changing to a comma the second and subsequent full stops. Some commands permit or require that a parameter be specified and this will always be a decimal number within the appropriate range. Whenever a parameter is expected, but not specified, it defaults to 0. Again for ease of use and intelligibility, spaces may be added between commands and their parameters. Formatting commands mat also be entered directly from Command mode incidentally. Indeed, we gave an example, .NP and .YP. Let us therefore look at the text formatting commands which start with a full stop.

.PN	Sets the current page number. Don't forget that a number may be added, so .PN 50 will mean that the next page number printed will be numbered 51.
.PLN	Sets the line number on which the page number will be printed.
.PL	Sets the page length.
.FL	Sets the form length.
.HP	Sets the line number on which the heading, if used, will be printed.
.FP	Sets the line number on which the footing, if used, will be printed.
.PARAM	Quite a short manner in which six important parameters may be entered in one command. Indeed, very frequently this is the only formatting command that need be used. It will set the following:- Line number of heading Line number of page number Line number of top of text Line number of bottom of text Line number of footing Line number of end of form (form length) All of this information is entered as decimals, for instance, .PARAM 3,3,6,60,63,66.
.PC	Sets the number of characters to be printed to a line.
.ID	Sets the indentation from the left hand margin — thus .ID 10 sets the left hand margin to column 10. The .ID without a parameter resets the left hand margin to the first column.
.LINE	Enters a series of line feeds.
.LON	This is one of the few commands that will not take a parameter. It instructs the program to issue a line feed character after a carriage return is outputted to the printer. Some printers require this.
.LOFF	The converse of the above.
.NL	Turns off listing to the screen during printing.
.YL	The converse of the above.
.NP	Turns off the output to the printer.
.YP	The converse of the above.

Note that a page number may be added to any of the foregoing four commands so that the screen or print output may be turned on or off at specified pages.

.PAGE	This starts a new page.
.PNOFF .PNON	Turns off or on the automatic page numbering.
.ILN	Initialises the line counter to a specified value.
.HT	Specifies text to be printed at the top of the page.
.FT	Specifies text to be printed at the foot of the page.

Both .HT and .FT may use horizontal formatting commands.

.CC	This is a very important one and sends a control code to the printer. Most modern printers have the facility to specify various print options under software control. This, in fact, allows full advantage to be

taken of this facility by specifying the codes to be used. As with all other commands that accept parameters, the parameter is a decimal number. Thus, for instance, if your printer requires a CHR$(20) and a CHR$(21) to perform a particular function, this is outputted by .CC 20,21. So far as is known, any number number of decimals may be entered, although we do not know of any printers that use more than three in a set.

BAR — The Bar command allows control codes to be sited inside a line, whereas the command above requires a separate line.

.JOFF
.JON — Switches off and on the automatic justification so that the right hand margin does not have to be justified.

.nn — This enables the printer to move over to a specified column (nn). In other words it is a tab command.

.FOFF
.FON — Turns the text formatter off or on. .FOFF will cause the text to be outputted to the printer without justification and without recognition of control codes. Hence, therefore, although the code .FOFF may be embedded in the text and will be recognised, its converse can only be issued at command level since obviously once disabled, the formatter will not recognise the embedded code.

.PPON
.PPOFF — Turns on and off automatic paragraph recognition. Sometimes it is desired that paragraphs or larger blocks should not be separated by a page boundary. After .PPON, the formatter will look ahead every time a new paragraph or text block is encountered. If there is sufficient space on the current page to print all the text to the next blank line then the text will be printed on that page. If insufficient space remains, a form feed will be done and the text printed on the next page. This is a powerful pair of commands and perhaps of more use than will appear from our dull description of them.

.BREAK — Forces printing to terminate. Again it may specify a page number.

.PAPER — Causes printing to pause at the end of each page so that single sheets may be inserted.

.LOOP — Restarts printing of the current text.

.EJECT — Used at the end of the text to eject paper to the bottom of the page.

.PRINT — Text following this command is displayed on the video display during the printing of the document.

.PAUSE — A general purpose pause that causes the printing to stop until any key on the keyboard is depressed.

.LINK — This powerful command permits an unlimited number of text files to be printed as one document. Thus it is possible to split larger documents up into a number of smaller, more easily managed, units, particularly useful when a number of people are authorising one document.

MX SERIES
737 — Two types of printers have been very widely sold in England. Firstly the Epson MX series and secondly the Centronics 737 which is also available as a Tandy machine. Although the special codes of these machines can be accessed by the .CC command, for ease of use, a number of them have been given separate commands. These enable emphasised print, elongated print, condensed print, elite print and underlining. Some of these, of course, are only available on either one or other of the machines. Again the commands have been made very easy to remember. Emphasised print on the Epson, for instance, is called simply by .BOLD and to turn it off, .NBOLD.

Now we will turn to the line format commands which mostly start with one or more greater than signs.

> TEXT — With this command the text is printed centralised on the line.

> @nn,TEXT — The text is printed indented nn places from the left hand margin.

>> TEXT — The text is printed so that the last character is at the right hand margin. This command should not be confused with right justification. It is applicable when you wish to have a word or two right over on the right hand side of the page.

>>@nn, TEXT — The text is printed so that the last character is at nn places from the left hand margin.

\+ — Starting a line with a + sign suppresses the following carriage return. Some very interesting formatting can be done with this command in conjunction with the preceding line format commands.

\— — Starting a line with a — sign suppresses the preceding carriage return. The same remarks as above apply.

; — Use of the semi-colon at the beginning of a line designates the rest of that line as a comment within the text, that is to say, anything following the ; will not be printed.

< — Starting a line with a allows a temporary override of the current indentation setting. This is particularly useful when, for instance, one has a paragraph indented, but having numbers which extend further to the left. Temporarily overriding the indentation enables the paragraph number to be printed.

One or two concluding notes. If a printer is not connected and output is attempted to it, the machine will hang, but can be rescued by pressing the X key. AJEDIT fully supports lower case text for those who have the TRS-80 Model I lower case modification and, of course, supports it automatically on the Model III. An alpha-lock is provided. On the Model I it is the shift up arrow and on the Model III the normal shift 0. The program is booted in the upper case mode, in other words, capitals, whether the shift key is used or not. Pressing the alpha-lock will toggle to the normal typewriter mode. AJEDIT contains its own driver and will automatically detect on the Model I whether the lower case modification has been incorporated.

As can be seen, this is a comprehensive word processor program, but we hope we have been able to show how the commands have been made very easy to remember and thus the program simple to use. Some of the more sophisticated features of Scripsit, for instance, are not present, but, on the other hand, AJEDIT includes a number of the almost essential functions that Scripsit, for some unknown reason, omitted. Of particular relevance is the ability to get to DOS for directory information and access to control keys on the printer.

MODEL III GENIE

A meeting was recently held in London to introduce to English dealers and world-wide distributors of the Video Genie the Model III. A prototype was brought over by the manufacturers from Hong Kong and it is indeed a very nice machine. In that the purpose of the meeting was to get input from the people who will be actually selling it as to the features that should be included, obviously the prototype cannot be considered as a finalised design. It will, we would guess, when finished be as a double density disk machine with the option of one or two inbuilt drives and it will support normal DOS's and CP/M. It will be available in a junior model without any drives. Physically it is somewhat similar to the Tandy TRS-80 Model II in that the keyboard may be kept in its "pocket" and the machine is therefore integral, or the keyboard can be moved out on a cable. We particularly like this feature in that the operator can adjust his or her distance from the screen. The amount of memory is still very much under discussion, but I would not be at all surprised if it does not exceed 64K. It probably follow the route of most mid to upper range microcomputers in that it will be aimed at the more serious personal computer users and small businesses. From what we saw of it, it is a very nice machine and well worth looking forward to. Hopefully (after our strong pressures) it will maintain software compatability with earlier models and, therefore, with the TRS-80, although at this stage it is rather difficult to see how this is going to be achieved. It is, however, now a prime design criteria, so let's hope they make it!

MINI UTILITIES — THE FIRST OF THE FEW?

The trend now is more and more towards bigger utilities, that is to say, composite programs containing a number of different utility commands. There is, however, still a demand for the more normal utility program which contains say half a dozen commands, and we wonder if there is not a market for yet smaller utilities containing just one feature, carefully chosen so that it will be of use to the most people. Whether there be a market or not, we will attempt such a series and this is the first one. Many times in composing a program one wishes that one could change all of the Print statements into LPRINT or all of the LPRINT into PRINT. That is precisely what this mini utility does. It sits at the top of memory, is very short and can be called at will. It is not necessary to know that you are going to use it beforehand. If you suddenly decide half way through a Basic program that you want to change everything, or when you have finished a program, then just load this mini utility and it will do this job for you.

EDJUST — EDITOR ASSEMBLER TEXT ADJUSTER

Elsewhere in this addition to the catalogue is described a brand new Assembler package from the same people who produced LDOS. Up until the issuance of that program, the Editor Assembler ''market'' was in a rather horrible mess because the majority of the Editor Assemblers available were (incestuously or otherwise) related to the original Editor Assembler from Tandy. EDJUST is an extremely useful program, but continues the ancestry of the Tandy Editor Assembler in that it is an appendage to EDTASM which itself was an appendage of the Tandy cassette based Editor Assembler. The original Editor Assembler was patched by Apparat, renamed EDTASM, and included free in NEWDOS and NEWDOS 80. It is necessary for a purchaser of EDJUST to own EDTASM.
EDJUST adds certain useful facilities to EDTASM and in particular it enables the maintenance of an assembly language routine library and a return to EDTASM after an unwanted reset without losing the contents of the text buffer. In addition to these facilities there are four new commands as follows: —

Change Current Line

This command searches the current line for the last string entered with the F command. If found, it replaces it with a stipulated string.

Move Lines

This command renumbers lines and moves them to a place in the text appropriate to their new numbers.

Search File for Lines

A stipulated file specification, which is assumed to be an assembly language file, is searched for lines with line numbers laying between two stipulated limits. If found, they are renumbered using an increment, then inserted into the text buffer in the place appropriate to their new numbers.

Join Lines to File

Lines having numbers between two stipulated line numbers are copied from the text buffer and added to the end of a stipulated filespec, which is assumed to be an assembly language file. They are first renumbered using the latest value of increment to continue the existing numbering of the file. This command, together with the previous one, enables the use of an assembly language routine library. Routines once entered into a program may be saved in a library with this command and used in other programs by means of the previous one.

The existing N command in EDTASM has been enlarged. The information required by the command is line number 1, line number 2, line number 3 and an increment. Lines having numbers between line number 1 and line number 2 inclusive are renumbered. The first such line is given line number 3 or, if that already exists, line number 3 plus the increment. The second has increment added and so on. Renumbering is not performed if it would cause lines to have duplicate numbers or numbers out of order, nor would it be performed if it would cause a line to be greater than 65529.

KNIGHT — A DELUXE TOUR

On page 43 of the catalogue is descibed a Knight's Tour puzzle. We are sure that the author will not mind if we descibe it as a normal or standard version of the puzzle game which, no doubt everybody knows, involves moving a chess knight in such a way that it lands on every square of the board. Knight is a program for fanatics of the knight's tour on the chessboard, as it will carry out the following functions: —

1) Compose knight's tours.
2) Enter a part tour and have the machine find all tours starting that way.
3) Examine, invert, reflect tours once composed or found.
4) Save tours for later examination.

Knight will theoretically find all possible tours on the chessboard. There are so many millions that it would take a very, very long time. Even smaller objectives, for instance to find all tours starting with, say, a particular set of three moves, can take a long time. Tours, when found, may be displayed in numerical or semi-graphical format, printed on the line printer or simply counted. Rather as the Blackjack simulation, described elsewhere in this addition, is a serious study of the game of Blackjack, so this program is a serious study of the Knight's Tour puzzle.

EDIT — A FULL SCREEN BASIC EDITOR

Basic programs can be edited in one of two ways. The interpreter itself contains a full editor, but it is not a screen editor. In other words, it is orientated to commands rather than, for instance, moving a cursor around the screen. Some people prefer this approach, but some people prefer the approach of a screen editor. Probably the fairest thing to say is that a screen editor enables the user to attain far greater program visibility as he is editing. As a result, so it is claimed, far fewer editing errors are made. Instead of editing just one program line, the user can see and modify 15 at a time. Automatic repeating cursor control keys are included, so it is simple to navigate to any character that must be changed. Once there, modifications, deletions or insertions are carried out simply and visibly. The cursor keys also give you controlled automatic scrolling up and down through the program so that the display can be the window on to any block of 15 lines. The principal features are as follows: —

1) Cursor controlled scrolling for maximum program visibility.
2) All keys automatically repeat.
3) Program change by overtyping, deletion or direct insertion.
4) Insert new lines or copy, move, replicate or delete existing lines.
5) Copy, move, replicate or delete blocks of lines.
6) Search programs for strings of characters.
7) Replace some or all occurrences of one string by another with a minimum of keystrokes.

FETCH – A LOADING AID

Both the TRS-80 and the Genie machines are, considering their price and ability, remarkably reliable machines. Mass production, however, being what it is, occasionally faults do occur. In the TRS-80, for instance, the most common problem for Basic users is intermittent failure of the contacts between the cable connecting the keyboard and the expansion interface, usually at the end attached to the keyborad. This can cause some rather surprising results from time to time, and it is mainly towards this difficulty that Fetch is aimed. It is used to fetch programs from the disk when difficulties are likely to be present. Thus FETCH EDTASM will load EDTASM and run it. The extension CMD is supplied by default. When it is not required, that is to say, the user wishes to load a program but not run it, a $ is inserted ahead of the file specification, thus FETCH $EDTASM/CMD. There is no doubt that using FETCH does ease the loading of programs from disk. It not only loads the software, but it also checks memory as it loads and if it finds a bad byte it puts the address on to the screen. It will probably not be a bad RAM chip, but one of the address lines in the interface cable. If Fetch finds an error, then it will try again up to four times before giving up the attempted load.

GARBAGE COLLECTION – FOR THE MODELS II AND III

One of the big disadvantages of the rather free and easy method of string handling in the Basic interpreter of these two machines is that periodically it has to get its string area sorted out. This results in a rather disconcerting hang up in the machine as it just sits there and appears to do nothing, with the keyboard, video and everything else locked out. It is, of course, working extremely hard inside, but this is of not very much reassurance to the inexperienced operator, nor is it particularly beneficial to any operator. The length of time that this garbage collection takes can get quite out of hand. It is certainly not unusual for it to take minutes, and on benchmark tests a time of 1168 seconds to sort out 4000 strings has been experienced. This program takes over the garbage collection from the interpreter and carries it out in a different way. It requires an area of memory to do this, but if this is not available it will automatically claim a work area on the disk. To give an idea of the advantage of using the program, 250 strings will cause a delay of 5.1 seconds with the interpreter as it is, but under half a second with the garbage collection in memory and 2.67 seconds with the collection on disk. At the other end of the scale, the sorting out of 4000 strings takes 1168 seconds with the interpreter, 10.8 seconds in memory and 28.3 seconds on disk. It can be seen, therefore, that the advantages of using this garbage collector can be very dramatic. The disk supplied comes with several program files suitable for different memory sizes. Whichever one is appropriate is selected and copied on to the disk being used. Thereafter it is really only a matter of calling the GARBAGE file. One of the nice things about this program is that if it finds that it cannot do what is intended, it returns control to the interpreter for the garbage collection, hence one is really never worse off. Snapp, the authors of the program, say that they have never seen an application which did not benefit from this new method of garbage collection.

EXTENDED BUILT IN FUNCTIONS – NOW FOR THE MODEL III

On page 85 will be seen the Extended Built In Functions described for the Model II TRS-80. A very similar package is now available for the Model III. The commands are described below. It is important to note that where the command in the Model III is substantially the same as that in the Model II it will merely be listed under the command syntax shown on pages and and reference must be made to those pages in order to ascertain the function of the command. Furthermore, the syntax given below is for reference only and is not necessarily the syntax used in the actual Model III version of the Extended Built In Functions.

PEEKW and PEEK$
POKEW and POKE$
ETIM$
FILES
SRT
SCMD CLEAR
SCMD ARRAYS
ID$
UC$
LC$
MAX
MIN
FMT$

New functions

DELETE – Delete statements from the resident program
SWAP – Exchange values of two named variables
RESTORE – Set the data pointer to a user specified line number
ROW – Returns a number from 0-15 indicating the current vertical position of the cursor
PW – Calculate an encoded password or extract the master password from any mounted diskette
HEX$ – Hexadecimal conversion
PK$ – Pack a string into a compressed format
UPK$ – The reverse of the above
PDATE – Packs the date data into two bytes
UPDATE – The reverse of the above

This program is a further step forward for Snapp in making all of their highly useful Model II utilities available for the Model III. Although we would not perhaps say that this program is as essential as Extended Basic for the Model III, nonetheless it does contain a large number of useful features.

HINTS AND TIPS DECEMBER 1981

The most common tip that I am asked about is how to change memory reservation whilst in Basic. Quite frankly it comes up so often that I am not sure whether I have mentioned it before in these columns or not. In any event, the procedure is quite easy. It is only necessary to Poke into 16561 and 16562. The trick is that a CLEAR statement must follow the Poke as this will reset all the pointers. So far as I know, the value of the CLEAR is not important and normally, I suppose, would be CLEAR 50. As to the value to Poke, addresses are held in memory in reverse order in hexadecimal. If you are in disk Basic then, of course, it is only necessary to spilt the address in two, thus, for instance, changing the reservation to 43707(AABB) would be POKE16562,&HAA:POKE16561,&HBB:CLEAR 50. For Level II users (who have not bought Enhanced Basic or Level III!) convert the decimal number to the hex, split as before and then convert the two halves back to decimal. Thus the above example would become POKE16562,170:POKE16561,187:CLEAR 50. The Hints and Tips in July, of course, gave the equation for getting at the number to Poke.

Another tip that often comes up is how to carry out an Auto Execute for system tapes. Normally, of course, one types / in response to the second asterisk, or /nnnnn where nnnnn is the starting address of the program being loaded. The program hopefully then starts. It is possible to have a program start on its own. In other words to obviate the necessity of the second asterisk prompt. What has to be done is to Poke into 16866-8. Into 16866 we put the code for a machine code JUMP. This is C3 in hexadecimal or 195 in decimal. Let's do that first then – POKE 16866,195. Now you have to know the Entry address of the program in question. Actually the whole exercise is a bit of a non-starter, if you do not know this address – remember that it is the Entry (not the Start necessarily) address that you need. Let's assume that it is 7000 hexadecimal. As described above, for some obscure reason, addresses used by the Z-80 are usually referenced backwards (actually it's a hangover from the 8080 chip) and anyway always in memory. So, splitting our address into two we get 00 70. The 70 in decimal is 112 so POKE16867,0:POKE16868,112 should complete the exercise. Try it before you load your next SYSTEM tape in Level II. It does not work by the way in disk Basic, nor the Model III. If you are into machine language programming, the Assembly goes something like: XOR A:LD HL,41E2H:LD (HL),0C3H:LD HL,7000H:LD (41E3H),HL.

The Model III handles the BREAK key a bit differently than does the Model I – bit of a dirty trick, but it does enable the user to stop a bad tape load without a reset amongst other things. Anyway, the other side of the coin is that it is no longer possible to hit the BREAK

key at the end of a System load (rather than execute) to get back to the READY prompt. If you need to, a useful tip is to type /6681 after the load on the second asterisk, this will give you the READY prompt. 6681 is decimal for 1A19H and is generally recognised as a safe re-entry to Basic Ready, although I must confess it is not one of my favourites. Nonetheless, one is back in Basic and can, for instance, POKE to change the cassette loading speed.
One thing that people do tend to overlook when they are using cassettes is that cassettes stick, in fact they can stick quite easily. The solution is equally easy, give them a sharp bang! The easiest way is to put them back in their library boxes and just knock them down on a table a few times.
Penultimately. a prayer from the collective hearts of all of us at Molimerx — the contacts of that cable going from the keyboard to the Interface of the TRS-80 Model I are capable of causing the most diabolical, irrational error messages known to man! The printed circuit board fingers are not gold plated (probably the greatest sin since the apple incident — and I don't mean the Apple) and thus oxidise, causing intermittent bad contacts. If you are running disks particularly and you get unexplained error messages, either wiggle that connector around or better still clean it every few hours of use with a spray switch cleaner. Most importantly remember that the error messages will have nothing to do with the connector. There is no error message in the machine MY CONNECTOR IS DIRTY but there is ATTEMPTED TO READ READ ONLY MEMORY, DISK I/O ERROR, CAN'T FORMAT etc. etc.

And finally, from us all, have a very happy Christmas and a prosperous NewYear . I am not sure yet what our opening hours will be but if you have any problems leave a message on the answering machine, we will be checking it from time to time over the holidays.

DEFEND — THE NEW ACTION GAME

From time to time there have been many arcade games published for the TRS-80 and Genie, but the space type action ones that have really been runaway sellers have been Invaders and Asteroids. There have, of course, been many versions of both, but we feel that our English written versions have been the best and we are pleased to continue this tradition by now publishing the newest of this type of software — Defend! Invaders is a great deal of fun, but is really played in one plane, vertical. Asteroids is more ''three-dimensional'', but is concerned with inanimate objects, namely lumps of rock. In Defend you feel that you are actually in there fighting and caught up with the excitement of the game. Essentially it is not too much different from most other arcade games. The object of the exercise is to shoot down enemy ships which are coming at you, firing at the same time. If you are skilful or lucky enough to obliterate them all, you have to navigate through a heavy shower of meteorites. If you get through that then you must navigate a tunnel before you are in the clear. The game is played in the horizontal plane, that is to say, the enemy is coming at you latitudinally, but one of the great features of it is that you are able to control your ship in all directions in the single plane. In other words, you can not only go up and down and both directions of sideways, you can also go diagonally. In the highest of the three levels of play the control of the ship is particularly crisp and fast, nontheless you will need skill not only to avoid the shots of the enemy, but also to avoid collisions with them. Dodging around in the shower of meteorites is not very much fun either. The sound effects are good and there are three levels of play. Five highest scores are maintained and a chart of them is displayed every time a game is displayed. In addition to your main armament of laser cannon you have a most important further armament, namely a limited number of Smart Bombs. These will cause all ships on the screen to become impotent. They will still exist but they will not be able to fire at you. As they are still in existence, however, a collision with them can lose you a ship. The big advantage of these bombs is that you are given a score for the number of enemies that the bombs annihilate, thus it is far better to use a smart bomb if you have a screenful of enemies than if you have only got one on the screen. Another important feature of the game is relevant here. Up in the right hand corner of the screen is shown a rectangle which has a divider about two thirds of the way along from the right which, of course, divides the rectangle into two areas. The area on the left represents the screen. The view on the right represents the area imagined to be immediately to the right of the screen. It will be recalled that the play is horizontal, hence the larger area to the right in the rectangle represents the space which is just being approached. The effect, therefore, is that one has a preview of the number of ships coming up on you. If a smart bomb is used with one eye on the enemy ahead, it can be quite devastating. A hyperspace control is also included. This is similar to the one in Asteroids and when activated merely moves your ship to another part of the screen. You start play with five ships, but a score of 10,000 will give you an extra ship and an extra smart bomb. You have three of the latter to begin with. Different types of enemy ships, of course, give you different point scores and they vary from 200 to 100. Incidentally, just as you can manoeuvre your ship diagonally, so can the enemy shoot and move diagonally. These sort of games are very much a matter of taste, but Defend has been test played by a number of people, all of whom have played other arcade type microcomputer games, and for once they have been unanimous in thinking that this is the most enjoyable. As mentioned above, there are three levels of play. These affect a large number of the game parameters, for instance, a different number of aliens will appear with each level, the lowest has 30 and the highest 40 to start with. The number of missiles that can be on the screen at any one time is also affected, a maximum of 6 on the highest level of skill. Every time the whole course is completed, five aliens are added, up to a maximum of 60. The disk and cassette versions are essentially the same, although the former does save high scores to disk. It is, of course, compatible with all current Genies, but will not be compatible with the earliest Video Genie unless it has had arrow keys and a clear key added.

NEW SOFTWARE FOR THE TANDY COLOUR COMPUTER

RACING DRIVER — IN FULL COLOUR YET!

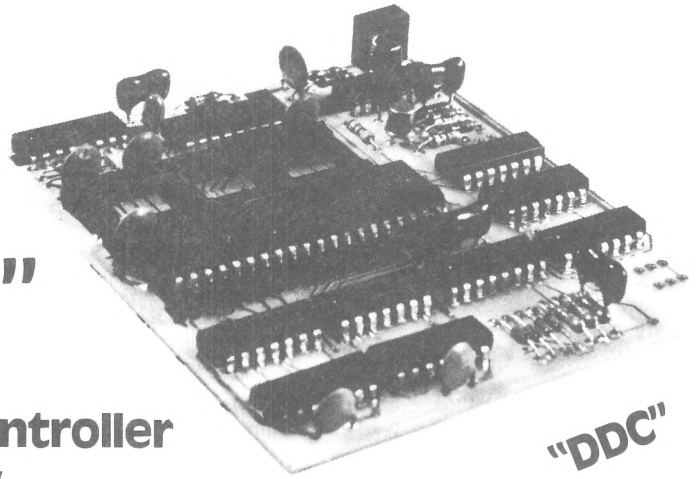
There have been a number of programs written which simulate the driving of a racing car along a speed track. Some do it on a plan basis, viewed as from a helicopter looking down at the track, and some from the driver's position. This program is very similar to the one described on page 4 of the catalogue in that, whilst driving, you are able to see the road ahead of you, not a plan of the whole course, and therefore you have to be pretty fast to avoid crashes. Obstacles are placed in your way and sheets of ice form on the track from time to time, sometimes sending you off in a random spin. The program takes full advantage of the facilities of the TRS-80 colour computer, for instance, in driving the car you can either use the Tandy joystick or two keys, sound is included throughout the game and the display is as colourful as one is likely to see. A running best score is kept and there are three levels of skill. These do not affect the speed of the vehicle, but they have a more pronounced effect on the number of obstacles and ice patches supplied.

SPACE FIGHTER [COLOUR] — AN OLD FRIEND

Before we forget to mention it, there are now two colour versions of Space Fighter, the first was introduced a little time ago for the modified Video Genie colour computer. This program is for the TRS-80 Tandy colour computer. These two machines are not compatible, so customers must state for which machine they are buying the program. Space Fighter is a well known program which we have marketed for a number of years. The idea is that you are out in space, under the stars, with five enemy fighters to shoot down. You are, of course, provided with sights and laser beams and if you get everything just right your enemy is destroyed. This program has been chosen to convert to colour because it seems to lend a certain amount of realism to the program and now that the Tandy colour machine has provision for joysticks and sound, Spacefighter has been born again!

Aerocomp's Proven Best-By Test! The "DDC"

Double Density Controller



★ Technical Superiority

At last! A double density controller for Model I with HIGHER PROBABILITY OF DATA RECOVERY THAN WITH ANY OTHER DOUBLE DENSITY CONTROLLER ON THE MARKET TODAY! The "DDC" from Aerocomp. No need to worry about the problems that keep cropping up on existing products. AEROCOMP'S new analog design phase lock loop data separator has a wider capture window than the digital types currently on the market. This allows high resolution data centering. The finest resolution available with digital circuitry is 125 ns (nano seconds). The "DDC" analog circuit allows infinately variable tuning. Attack and settling times are optimum for 5-1/4 inch diskettes.
The units presently on the market use a write precompensation circuit that is very "sloppy". Board to board tolerance is extremely wide - in the order of ± 100 ns. The "DDC" is accurate to within ± 20 ns.
The botton line is state of the art reliability!

★ Test Proven

Tests were conducted on AEROCOMP'S "DDC", Percom's "Doubler A"* and "Doubler II"* and LNW's "LNDoubler"** using a Radio Shack TRS80*** Model I, Level 2, 48 K with TRS80 Expansion Interface and a Percom TFD100* disk drive (Siemens Model 82). Diskette was Memorex 3401. The test diskette chosen was a well used piece of media to determine performance under adverse conditions. The various double density adapters were installed sequentially in the expansion interface.
The test consisted of formatting 40 tracks on the diskette and writing a 6DB6 data pattern on all tracks. The 6DB6 pattern was chosen because it is recommended as a "worst case" test by manufacturers of drives and diskettes. An attempt was then made to read each sector on the disk once - no retrys. Operating system was Newdos/80, Version 1.0, with Double Zap, Version 2.0. Unreadable sectors were totalled and recorded. The test was run ten times with each double density controller and the data averaged. Test results are shown in the table.

★ Features

TRS80 Model I owners who are ready for reliable double density operation will get (1) 80% more storage per diskette, (2) single and double density data separation with far fewer disk I/O errors, (3) single density compatibility and (4) simple plug-in installation. Compatible with all existing double density software.

★ TEST RESULTS ★

MFR & PRODUCT	SECTORS LOCKED OUT (AVG)
AEROCOMP "DDC"	0
PERCOM "DOUBLER II"	18
PERCOM "DOUBLER A"	250
LNW "LNDOUBLER"	202

Note: test results available upon written request. All tests conducted prior to 8-25-81

The above, of course, is an extract from the advertisement run by Aerocomp of the United States in a number of U.S. magazines. Some time ago we started to receive requests from customers for a Doubler board, so we consulted with Logical Systems Inc. in the States, who, of course, wrote LDOS. They recommended to us the board made by Aerocomp and it certainly seems to be an extremely good product. We are therefore stocking this product. It is compatible with LDOS, NEWDOS 80 and, so far as we know, all other double density DOS's. It is not, of course, compatible with the Video Genie which has its own double density board.

EPSON PATCH — A SCRIPSIT PATCH FOR THE EPSON MX-80 PRINTER

To say the least, the MX-80 series of printers constitute an extremely versatile range, in fact some of the things it can do are little short of miraculous. The problem is that Scripsit can access virtually none of these advanced features and it is the purpose of this patch to make these functions available to the user. Versions are available for either the cassette or disk versions of the Model I Scripsit. There are several versions of the MX-80 around, so perhaps one should not be too definitive about it, but so far as we know, this driver will support all of the print types of the MX-80, in particular as follows: —

Condensed
Normal
Enlarged
Emphasised
Double
Condensed/Enlarged
Emphasised/Enlarged
Emphasised/Double
Emphasised/Double/Enlarged
Condensed/Double
Condensed/Double/Enlarged

Printer formats may be mixed freely with standard formats. A pseudo, but effective, underlining is supported, as also is sub and super scripting. Individual characters or words in a line may be underlined, but this will be at the expense of right hand justification. There are a number of other little gems included in this driver.

FED — THE LDOS FILE EDITOR

There are several zap programs on the market, naturally we feel that Prozap, which we publish, from Nigel Dibben is the best. Most of them include access to the relevant tracks and sectors by stipulating the file name and this is, of course, very useful. FED, however, is an all purpose screen orientated file editor. In other words, it will access the file directly on the disk and modify or build it as required. Unlike the zap programs, it is not designed to repair damaged disks or recover lost files, although an experienced operator could use it for these purposes. You cannot create or extend files with FED, nor is it a sector or file copier. It is entirely dedicated to displaying, printing or modifying existing files at a file level, not at a tractor or sector level. FED is intended to run with the LDOS operating system only and is not guaranteed with any other. Complete editing capabilities are supported, including hexadecimal and ASCII modifying, thus direct disk patching is a very simple matter. It is even possible to write machine language code directly to the disk. Small changes in files, for instance, can be made almost instantly. The normal facilities of a disk access program are provided, including record advancement, back spacing and positioning. A file may be paged through very quickly in either direction. Most important of all, the user need not know any diskette information such as density and number of sides, number of sectors per granule etc. The beauty of FED is that it is only necessary to know the proper filespec in order to gain access to that file. Searching in both ASCII and hexadecimal are, of course, supported this includes onward search. One feature that we find extremely useful we would like to describe a little more fully. As a software house we are, of course, continually concerned with patching programs and we believe that the end user is also concerned with this function, although perhaps not as frequently. A common problem that we run up against is that an author will supply a patch referenced to the load address of the program. In other words, he will frequently tell us to patch a certain address in memory and leaves it to us to reload that patched program back on to the disk. This is both time consuming and extremely prone to error. The function in FED of which we speak will allow a user to enter into the program a memory address. The program will then automatically calculate where that address lays on the disk file. In other words, given the memory address of a patch, one can automatically find out where it is positioned on the disk. Not only does the program tell you where it is, it shows you. It calls up the relevant sector and positions the cursor over the relevant byte. Almost as useful is the reverse of this function. A command will instruct the program to display the ultimate memory address of the byte laying under the current position of the cursor. A printer is, of course, fully supported. Finally, FED supports two methods of screen display, one is a 256 byte screen which most zap programs employ, but the other is a 128 character display mode. This gives a lot more room on the screen and makes the display more legible. The program supports over 20 commands plus the usual cursor movements.

LOST COLONY — MANAGE A NEWLY COLONISED PLANET IN DEEP SPACE

Lost Colony is a resource management simulation. The player tries to run a hypothetical economy on "Warrens World" with limited powers. It is a democratic simulation in that the player will be turned out of office if the workers under his control become dissatisfied with his administration. In the game, worker satisfaction is a function of their standard of living. In order to bring the game within some reasonable limits, all economic activity is condensed into five broad industries: farm, minerals, energy, manufacturing and transportation. The farming industry, as might be expected, produces food for the colony. Minerals and energy industries yield all of the raw materials used on Warrens World. These include — in addition to things like steel and hydro-carbon based fossil fuels — plastics, electricity, glass and a wood substitute. These products are then consumed by the manufacturers, who are under the direct control of the colony's leader. From the manufacturers come consumer goods, robots and heavy machinery. The transportation industry, in turn, makes use of some types of heavy machinery both to supply the needs of the other industries within the colony, and to explore and settle new areas of the single continent on Warrens World. Exploration and settling of new territory are necessary to bring new sources of raw materials into production. In order to achieve production in any industry there must be people working in it. Beyond that, there are several factors which, collectively, determine the productivity of workers in the industry. These include the number of production sites, the living standard (or rate of pay) for the industry and the amount of capital equipment assigned to support the labourers. It follows, then, that to correct a shortfall in any industry the player need only allocate robots from the current year's production. He can raise the living standard, or induce more people to go to work in the blighted sector of the economy by doing the same. There are limits on the player's freedom to do these things, however. First, only so many robots will be effective in raising productivity. The rules to determine this limit are complicated and vary from industry to industry. In practice, they are high enough to be ignored most of the time. It is the workers of whom one must be careful. While raising the pay scale selectively to balance shortfalls in production is effective, it has the ugly side effect of making those workers who did not receive a raise less happy. If the disparity in wages is large enough, they will threaten to walk off their jobs unless you meet a frequently outrageous demand for consumer goods. Note that all wages are paid in consumer goods and that the living standard for any industry is proportional to the wage rate. If too great a differential exists between the living standards of separate industries, you will be turned out of office to work in the fields. There is a second way to alienate the masses in this game and that is simply not to pay well enough. This is the most common cause of changes in government. Your people have an expectation that their lot in life will improve. In the early days of an administration they, realistically, do not expect to live like kings and queens. However, the minimum living standard below which unrest is generated rises steadily with time. A table of this minimum is included in this documentation. The problem to be solved is the difficulty of fabricating enough industrial machinery to expend the economy faster than the rate of population growth, while simultaneously producing enough consumer goods to keep the workers pacified now. Overbalancing in either direction — too many consumer goods, or too few — will result in the termination of your term in office. To continue in power until a ship arrives from Earth is the goal. This will usually happen in year fourteen or fifteen. By then a successful colony will have approximately doubled in size and explored most of the world for valuable deposits of raw materials. Resource management games such as this one have, of course, been known for a long time. They probably all stem from David Ahl's Hamurabi. These newer ones, and this is a very new one, however, are considerably more sophisticated and, at least to our taste, give far more enjoyment.

SHUTTLE II — MORE THAN AN UPGRADE

The game shuttle is described on page 78 of the catalogue. It is an exremely good simulation of the Shuttle flights of the space vehicle Columbia. The author has now added some features to it. Apart from some new display features, there are three principal improvements. The first is rather out of reality, but does add additional interest when one is orbiting the earth with little else to do. An orbiting

satellite has been included so that when in orbit the player can use it as a target for orbital rendezvous exercises. The second new feature is that the program now stores the position of the home base of the Columbia and is able to track the Shuttle relative to that base. In other words, one can aim to land there rather than simply anywhere on the surface of the earth. This, of course, is more realistic in that the real Columbia has always had a specific landing spot. The final improvement, hopefully, does not add realism to the real Shuttle, but certainly adds interest to the simulation because on a ratio of 1 in 5, the player will experience an engine malfunction during or shortly after the blast-off period. How he copes with this, no doubt, will sort the men from the boys! Shuttle always has been an extremely good program, these changes make it into a first-class one.

COMPUTER POOLS – INCLUDING FORM PREDICTION

We already publish a pools forecasting program described on page 36 of the catalogue. This program is similar in many respects, but does have some added features which made it worthwhile publishing. Present owners of Pools should be aware that the current program is not written by the same author and hence updates cannot be carried out. Computer Pools is a program written to help you predict the results of football matches for the football pools. We must make the usual disclaimer that it will probably not make your fortune and certainly no guarantee is made in this respect! It will, however, we believe, increase your chances, and certainly make the mundane task of filling in the coupon more enjoyable. The important feature of Computer Pools over the previous Pools is that it stores the performance of a team in its three previous home games and three away games and uses this to help predict the result in the next match. Various weightings are incorporated, although they can be overridden by the user if he so wishes. This enables the football enthusiast, i.e. the punter who knows what he is talking about, to use his experience and hopefully improve the computer's predictions. Basically the program allows you to keep track of the performance of the 130 teams in the four English divisions and the three Scottish divisions. As mentioned, it keeps track of each team's performance in its previous three home games and its previous three away games and combines these to predict a performance potential. It then compares the performance potential of teams in forthcoming fixtures and lists the matches, indicating those with the greatest likelihood of away wins, draws and home wins. Because the form is based upon the results of the three previous home games and three previous away games it takes approximately 6-9 weeks before the full form file is created and therefore that the full predictions can be made. The program is cassette based at the present time and a quantity of data has to be maintained. The user should be aware, therefore, that he will require at least two or three blank C90 cassettes.

BASIC INSERT – SOPHISTICATED STRING MANIPULATION

A basic definition of the use of this program is easy to give. It will take the contents of a string variable and insert it into a stipulated line of a Basic program. Its uses, however, are many and varied. This magic, incidentally, is carried out by a machine language program which is accessed by a subroutine with the USR statement whenever needed. Let's look at some of the applications. Assuming that you have a string variable equal to "X = 10:Y = 20" the program will, on command, tokenise the string and insert it into a dummy line in your existing Basic program. The newly inserted line can then be branched to and the contents of that line (as it is now tokenised) will be treated by the interpreter as if it were part of the original program. This is a powerful tool. Consider, for instance, a series of calculations stored on disk or tape in ASCII format. They may be read into your own Basic program and then inserted into the actual program and executed. It cannot be emphasised too strongly that although the program could be used for string packing for graphics or machine language manipulation, it is not a string packing routine as such, for the string is actually tokenised and inserted into a dummy line, whereafter it forms an integral part of the program. The string variable can contain any statement that can be tokenised by the interpreter, not just calculation type statements. To recapitulate, therefore, the three principal applications for this routine are:-

1) To store machine language code in a line of your program, thus alleviating the necessity of carrying out a System load of a separate machine language tape.
2) To store graphic code in a string to give fast graphic output to the screen.
3) By far the most useful, the ability to take, for instance, calculations from storage and automatically place them into dummy lines in an existing program.

The first two applications, of course, are generally well known and come under the generic title of "string packing". The use of this technique has been explained in the Hints and Tips column of the catalogue from time to time. This program needs a little bit of thinking about. It is one of these pieces of software which sounds rather unglamorous on the surface, but in fact can be extremely useful.

MATHS SPEED TEST – EDUCATIONAL AND FUN

This program is a clever attempt to make basic mathematics a little more palatable than it normally is. Essentially what the program does is to give you up to 20 questions at a set speed. It then times the length of time it takes you to answer and keeps a running note of the fastest score. It is, therefore, essentially both a game and an education. The questions are purely mathematical and two levels are provided. On the first, that is to say, the easy level, the questions are simple questions of the 6 x 12 variety. On the second level one is given the choice of questions on either addition, subtraction, multiplication, division or a mixture of them all. These questions are obviously somewhat harder, although all of the questions generated by the program are capable of being worked out mentally. In other words, paper and pencil is considered to be cheating! This program will support sound.

MILES PER GALLON – SAVE SOME MONEY ON YOUR CAR

There have been a number of programs on the market which have purported to assist the car owner in getting the best mileage and performance out of his vehicle. The ones that we have seen have not been particularly good, and in the main were really file handling exercises which simply kept a record on the computer rather than on paper of the miles per gallon and other performance factors. In the July 1981 issue of Byte magazine there appeared a very involved and technical article which explained the Kalman approach to a certain statistical problem. Although that problem had nothing to do with the subject under discussion, the techniques evolved by Mr. Kalman became known as the Kalman Optimal Recursive techniques, or simply Kalman filtering. The author of the article, Jerry Lobdill of Austin, Texas, took Kalman's technique and addressed it to the problem of petrol consumption of a car. It is this article that Chris Wilkinson has used as his basic research. Changes in the mileage which a car will travel to a gallon of petrol are very important indicators as to the state of the health of the vehicle. In many respects it is similar to the pulse of the human body in that it is the one parameter which gives an indication of how well the car is performing. Apart from this diagnostic use, the economic factor rears its ugly head as petrol has now gone beyond the realms of being expensive and has entered the stage of being exorbitant, hence any small fraction of a gallon that can be saved is welcome to most of us. The program, when supplied with details of fill ups, calculates the miles per gallon and compares this with the expected value. It is this expected value which has previously been calculated by the program using the Kalman filtering technique. The comparison of actual and expected values allows both sudden changes and longer term changes in petrol consumption to be detected. A sudden change might be indicative, for instance, of a failed spark plug, a longer term change could be due to the gradual wear of points and plugs. As we all know, it is imperative that a car owner should change his oil from time to time and it is not really disputed that the more systematic and regular these changes are, the better it is for the condition of the vehicle. Accordingly this program will remind you of when it is time to change oil and, additionally, prompt you to other events as previously chosen by you. When you run the program, the first thing that must be done is to set up a file containing the vital statistics of your vehicle. You will be asked for a number of different inputs and it may be of use if we go over these briefly here for they will indicate some of the features of the program.

1) Initial mileage reading

   The speedometer reading at the time that the program is first run should be entered.

2) Expected Miles per Gallon

   This should be an educated guess. Alternatively, a manual record of one or two fill-ups can be made, but it does not matter if the figure entered is a little inaccurate, it would simply generate a spurious warning message for the first run or two.

3) Number of Events to be Flagged

The decision must be made here as to how many events such as oil change, point adjustment, brake adjustment and services of which you wish to be notified. If you do not wish to use this section of the program then no events need be entered, but if you do enter some, the number must be less than 10.

4) Defaults

For each of the further parameters a default has been supplied by the program. You can either elect to accept those defaults or to enter your own figures.

5) Variance of Miles Per Gallon

The default is .02. This is the factor which governs how much notice is taken of each new miles per gallon value in calculating the expected value. This is an important entry and will require some thought. If you allow the variance to be high, then you will not get the warnings you need, on the other hand, if you set it too tightly you will get a lot of spurious warnings. You must also consider whether you normally do a lot of motorway driving or a lot of town driving as obviously this will affect the consumption.

6) Variance of Measurement

The default is 0.4. This factor takes account of inaccuracies in the measurements of the total amount of petrol and the mileages.

7) Threshold for Short Term Alarm

The default is 1.26. If the calculated miles per gallon is greater than plus or minus the short term alarm threshold away from the the expected miles per gallon, a short term alarm message will be displayed.

8) Threshold for Long Term Alarm

The default is 2.53. The long term alarm is calculated by summing the differences at each fill-up between the calculated and expected miles per gallon. If this sum is greater than the threshold, the long term alarm message is displayed.

The above completes the parameter initialisation. It should be mentioned that they can be changed at any time. In order for this program to help you, there are one or two things that the user must do to help himself. Most important, of course, is that the figures entered into the computer must be reasonably accurate. Certain in-built variances are allowed for as explained above, but gross errors in input will cause gross errors in output. Although not literally essential, it is certainly very strongly advised that when you start to use this system, future fill-ups should be to the top of the tank. It is possible to alternate between half filling and filling your tank, but if you want to make full use of the facilities of the program you should be prepared to get into the habit of filling your tank to the top on each occasion. This obviously does not mean that you use more petrol, nor expend a greater outlay in cash at any time, for you can fill it up as often as you wish, you do not have to wait for the tank to be empty before you fill it. It is probably true that the more frequently you buy petrol and therefore run the program, the better, as to some extent the program increases in accuracy and efficiency as it goes along. Needless to say, fleet owners or other owners of more than a single vehicle can use the program, and fleet owners particularly may well benefit substantially. The program is available on cassette or disk. Customers must state which as they are different versions.

TRIUMPH OF ROME — A ROMAN WAR GAME

War games are getting more and more popular for microcomputers. The Triumph of Rome is another one from perhaps the originator of this new type of software, Dr. R. Bodley-Scott. It is set at the beginning of the 2nd century B.C. and the game depicts the war between Antiochus III of the Seleucid Kingdom and the advancing legions of Rome fresh from their recent victory over Carthage. The Seleucid Kingdom was a Greek empire stretching from north east Greece to the western borders of India. The prize over which the two warring nations were fighting was the domination of Greece and the Greek cities of the western coast of Asia Minor. Invited into Greece by the Aetolians and Thebans, Antiochus sailed across the Aegean Sea with an army and set about conquering northern Greece. In retaliation, the Romans sent a larger army from Italy, which succeeded in driving Antiochus back to Asia. After several naval actions in the Aegean, the Roman fleet was finally victorious, and their army crossed the Hellespont into Asia unopposed. They then joined up with their ally, King Eumenes of Pergamum, and defeated Antiochus at Magnesia. In the peace treaty which followed, Antiochus was forced to surrender his western territories to Rome's allies. In the basic format, the game is similar to Hannibal (see page 42 of the catalogue), but certain key improvements to the program logic have made the simulation of ancient warfare both more realistic and more decisive. A typical game will take about 3 hours to play and a facility for taping a partially completed game is included. Three maps are provided depicting Greece and the areas of Asia Minor on the Aegean Sea. The forces at the disposal of each player include infantry, cavalry, elephants, siege artillery, warships and transport ships. Taxes are raised, troops paid and new troops recruited. The program covers naval engagements, land battles and sieges and, of course, takes full account of the different capabilities of the various troop types in differing circumstances.

CITY ENCOUNTERS — GOES WITH RANDOM DUNGEON GENERATOR

City Encounters is a companion program to Random Dungeon Generator described on page 80 of the catalogue. It is a game aid for umpires controlling ''paper and dice'' fantasy games. When used in conjunction with the sets of rules suppiled with these games, City Encounters forms a complete system for creating city adventures. Many thousands of permutations ensure a wide variety of encounters and adventures in the city for both inexperienced and experienced players and player characters. Typical city adventures for lower level characters might include tavern brawls, burglaries, assassinations, rescues, attacks by rivals or thieves, brushes with the militia, forays into the surrounding countryside, and, using Random Dungeon Generator, raids on rich tombs, temples etc. The campaign can grow as the players' characters climb up the ladder of thier chosen professions, so that eventually they can become involved in matters of high state policy or even aspire to the throne. The only limit to the expansion of the game is the umpire's and the players' imaginations. City Encounters is a completely menu driven program. Firstly, it can create new player characters, giving scores for strength, intelligence, wisdom, charisma, comeliness, dexterity, constitution and psychic faculty. It details the character's family background and social level. It describes his age, height, build, complexion, hair colour and voice pitch. It lists his starting funds, with which he must make his way in the world. (If the son of a beggar, he must start without such luxuries as money!) Secondly, the program will give a description of the street in which the players currently find themselves. This can either be used randomly as the players wander around an unfamiliar city, or it can be used to help build up a permanent gazetteer of their home city. Subsequent ''dungeon'' and ''wilderness'' adventures can use this home city as a base. When they have acquired enough money, the players can buy their own house or business, and work their way up the social scale to achieve fame and power. Thirdly, the program will give details of encounters in the streets by day, in the streets by night, in taverns, and in areas where those offering or seeking employment gather. The program details the type of encounter (e.g. attack, insults, questions, propositions, pocket picking etc.) and the reasons for the encounter (e.g. attack because of mistaken identity or racial hatred, or to capture the players as slaves or for sacrifice, propositions of buying and selling, or employment in a large variety of tasks or services.) The list of possible reasons is far too long to include here. The types of characters encountered include nobles, high officials, priests, sorcerers, fighters, merchants, thieves, courtesans, elves, dwarves, guildsmen of each of the various guilds, ordinary townsfolk and visiting country folk of every walk of life, militia, soldiers, sailors, thugs and beggars. The list is almost endless. Where relevant, the program gives their experience level and social level, any jewellery or magical items that they may be carrying, arms and armour, full lists of spells, and a breakdown of any followers or retainers. In a tavern, the program gives details of all the occupants. An offer of a drink to a likely individual may be the start of a whole new adventure. Should the players successfully burgle a house or other wealthy habitation, the program will give a breakdown of any treasure that may be found. At night, foul creatures walk the darker streets and unwary players may be unfortunate enough to meet ghouls, zombies, giant rats, gargoyles, vampires and others. Like Random Dungeon Generator, City Encounters has been designed so that it can easily be customised to fit the exact details of the particular set of rules used. Instructions for modifying the programs are given in the documentation and there is no difficulty in replacing the spells, monsters, treasures, gods etc. listing in the program by others which may suit the user's campaign better. Note that this program is not a complete game in itself and must be used in conjunction with a set of fantasy rules.

AMATEUR LOG — A UTILITY FOR THE HAM

This program is strictly for the radio amateur and will have no application to anyone else. It is designed to store and re-access all on air activity of a radio amateur and provides real time QSO logging, history file access, file update and create, repeater timer, QRA locator and full QSY facilities. In use, the time and date are entered into the program first of all, the form in GMT. The program then formats the screen with the work area and waits for a menu prompt as displayed on the split screen. In operation the QSO to be worked is first signed on to the system. The program will then check that the computer has been given a frequency that is being used for that QSO. If required, it will request a frequency in Mghz. The disk file is then opened to check through for any file with the same call sign. Only one file is created for each call sign on any given disk. If any previous QSO has been worked with that station, the computer will advise that a file exists and will display the first name of the operator and/or the last date worked. If the QSO being worked is not found on the disk, a file is immediately opened. Any file may be updated as required and 250 files may be created on a formatted disk. A disk with a minimum operating system on it can contain about 235 records. A repeater timer is available which, upon request, starts counting and displaying seconds from the internal clock. The seconds are displayed at the top right hand corner and will prompt the operator after 10 minutes, if not reset, or after 15 minutes to remind of call sign regulations requiring a call sign to be broadcast. This is particularly useful when transmitting RTTY. A QRA locator facility is provided which, upon entering the QRA locator, will display the grid reference. As will be known, TRSDOS updates it dates at midnight whereas NEWDOS+ does not. It is, therefore, advisable to use program with TRSDOS unless the feature mentioned is not important to the user.

DUEL IN THE DARK — IN A DUNGEON

This is a new type of game that combines the atmosphere of an Adventure with the interest of strategy and deduction. It is essentially what it says, a duel between two people in a darkened dungeon. When two human players take part then they are armed with a dagger and a knife. When a single player plays the computer then the latter takes on the form of a big, brown, fearsome bear. The dungeon can be visualised as a rectangle of squares. Players can move from one square to an adjacent one in turn. The dungeon is divided in to two rooms by a north/south partition wall with a door in it. The dungeon has two windows, but it is dark outside. The players cannot, therefore, see each other or the various items scattered around the room, but they can see the outlines of the windows. At the beginning of the game the shape of the dungeon, the position of the dividing walls, the position of the door and windows are decided at random, as also are the positions of the players, the various clue items in the dungeons and the directions in which the players are facing. There are three levels of play which determine the overall size of the dungeon. Level 1 gives about 13 playing squares, whilst Level 3 gives about 30. The player has three matters which should be uppermost in his mind. First of all, he has got to find out as much as possible about the dungeon, the location of the windows, the doors and the objects. Secondly, he must locate and kill the opponent. Thirdly, and probably most importantly, he must avoid being killed himself. Information about the room is gained in a number of ways. Appropriate messages indicate if, for instance, a player hits a wall. Another message would indicate when a player is passing through the door. A player who is in line with the window and is facing it is told that the window is visible. There are various other messages displayed from time to time. Apart from the permanent physical features of the dungeon, messages are given when the player encounters some objects such as a man trap. Stepping on the man trap means a delay of five turns. A really testing game can be enjoyed when the players agree that there should be no aids of any kind. Attacks by one player upon another take three forms, throwing the knife, stabbing with the dagger and grabbing the opponent. A good fun game and, with the bear supposedly loose in Hackney, certainly of interest at this particular time.

MAILIT — FOR SMALL BUSINESSES, CLUBS AND PERSONAL MAILING

This is a general purpose program which essentially services a mailing list comprised of up to 200 names and addresses on a single disk drive. It is somewhat more than a mailing list program as it provides the following features.

1) Customer file creation and amendment.
2) Letter creation and amendment for mail/merge facilities.
3) Customer file sort.
4) Reports
   - — customer list with missing numbers
   - — customer list in alphabetic sequence
   - — labels standard and non standard
   - — selection on all reports using a reference field
   - — Invoice printing on A4 stationery

Each entry on the mailing file can contain the following information: name, three address lines, postcode, telephone number, a reference letter address form, and, finally, miscellaneous information. Complete access to the files is given, they may be created, extended, entries may be inserted, amended or deleted. Files for 200 customers may be contained on a stripped down system disk. Only one disk drive, incidentally, is required. Instructions are included as to changing the program so as to increase the maximum number of customers allowed per disk. Each customer file contains a name (25 characters), address line 1 (30 characters), address line 2 (25 characters), address line 3 (20 characters), postcode (8 characters), telephone number (30 characters), reference/invoice number (6 characters). 41 bytes are also used for general information, part of it housekeeping, but also 19 bytes for a letter address form and 20 bytes for miscellaneous. The letter address form is only used for letter printing and is the form by which you wish to address that customer, hence ''Mr. Harding'' inserted in the address form will result in letters addressed to ''Dear Mr. Harding''. The 20 byte miscellaneous area is never printed, it does, however, appear on the screen and can be used for any internal purposes.
Mailit, therefore, is a general purpose customer service program which enables a record to be kept of each customer's details; enables standard letters to be mail/merged; invoices to be printed and generally carries out the other chores associated with a customer list. It is, as previously mentioned, particularly recommended for small businesses and has the particular advantage of enabling a number of functions which hitherto could be carried out by a number of programs to be amalgamated into one compact customer service program.

CONSTELLATION — TURN YOUR COMPUTER INTO A TELESCOPE

This unique program turns your computer screen into a telescope so that you may view the sky from any point on earth for any time and date in the 20th century. In other words, if you want to know what part of the sky looks like from, say, Calcutta on 12th January 1982, this program will show you. Details of over 40 constellations are contained in the program, together, of course, with the major planets of the solar system, that is to say, Mercury, Venus, Mars, Jupiter, Saturn and, of course, our sun. The only data that the user has to know is the latitude and longitude of the observer's position together with the date and time. The ''telescoping'' can be both moved and adjusted for magnification as there are four cursor movements for movement in East/West, up/down directions, together with two commands to zoom in and zoom out. Other ancillary commands include a re-centering display, setting a new cursor position and displaying the stars by constellation or magnitude. Although we have no knowledge of the subject covered by this program, it seems to perform its functions very well and will, no doubt, provide a useful tool to the amateur astronomer and other people interested in the subject.

SUPERCALC — FOR THE MODEL II UNDER CP/M

Supercalc is obviously going to be compared to Visicalc, so perhaps we should get some history out of the way first of all. Visicalc is copyrighted and trade marked by Software Arts Incorporated, who assigned the marketing to Personal Software Incorporated who in turn granted rights for the TRS-80 to Tandy. SuperCalc, on the other hand, is copyrighted and trade marked by a company called Sorsim Incorporated and, at any rate at the moment, is only available to be run under CP/M for the Model II. The version of SuperCalc that we

sell is compatible with the Pickles and Trout CP/M 2.2 or latest. This is rather an important point as there are patches required by SuperCalc or CP/M — depending on which way you look at it — so that SuperCalc will run with the particular version of CP/M which is being used. To be absolutely clear on this, the SuperCalc which we sell has been patched so that it will run as mentioned and it probably will not run on other versions of CP/M. SuperCalc is a big program and, as its name implies, it sets out to be an improvement over other matrix calculatory programs such as Visicalc and it seems to us that it succeeds in this objective. Visicalc is described elsewhere in this catalogue and in any event is extremely well know to almost anybody with a microcomputer. It is indeed probably the most popular program ever written. Although no doubt there are some differences, it can be safely taken that SuperCalc contains everything that Visicalc does, so we will run through a few of the points about SuperCalc that we particularly like.
First of all, it is, of course, an electronic worksheet type of program which is used to analyse problems in almost any field of endeavour, particularly in marketing, management, finance, budgeting, sales and engineering. Essentially a large blackboard is created consisting of 254 rows and 63 columns giving 16002 cells within which to enter or manipulate data. The screen is a window to this blackboard or worksheet. It is probably in the use of SuperCalc that its most improvements will be found. For instance, it has what is called an Answer Key. At any time whilst you are using the program, hitting the ? key invokes a Help command and lists on the screen explanatory text to guide you. This is getting to be more and more important as programs get more and more complex, that is to say that commands are made either almost self-explanatory themselves or a Help key is added as in some cases it is getting almost impossible to remember all the commands and with these new complex sophisticated programs it has been found that almost as much time is spent in looking up the commands and understanding them as is saved by using the computer in the first place; so the first important advantage is in the Answer Key. Another feature that we like very much is that you can have two windows showing at the same time on the screen, mainly for comparison purposes. For instance, if one's worksheet is made up into months of the year in columns, one can show December next to July or whatever; the screen, therefore, can be split. Indeed, it can be split into more than two separate windows as you can also view several separate areas of your worksheet at the same time. By combining the Window and Title Lock features you can lock certain rows and columns on to the screen and then scroll around each window to display other rows or columns that you may wish to examine. SuperCalc permits you to scroll each window independently so that the number of possibilities are endless. It is very nice, for instance, to be able to view your worksheet's formulae in one window and their values in another. Error messages are in the English language, that is to say, an attempt to access a protected entry will give you the error message ''Protected Entry''. Certain important data is continuously available at the bottom of the screen, your current active cell location, for instance, although this is probably not so important as it is highlighted on the screen anyway. Hitting the Enter key moves the cursor automatically in its last direction of motion and this last direction is continuously displayed at the bottom of the screen. As each column can be a different width, the width of your current program is shown. As you type in your command it is also displayed and, of course, you can edit it as you go, character by character or command by command. On the same line is shown the number of characters that have already been entered into the active cell. It is difficult to run out of memory inadvertently with SuperCalc as the current amount available for the worksheet is continuously displayed. Finally, the last row and column of the particular worksheet upon which you are working is shown. All of these features, plus many more, make SuperCalc a very friendly and easy program to use. The documentation is good and includes a tutorial course consisting of 9 lessons.

DARTS — AN ENJOYABLE SIMULATION

One supposes that there are some games which are impossible to simulate on a computer. Some, such as board games, are very easy. One which comes between these two extremes is the game of Darts. First of all, on a Model I Tandy or Genie it is virtually impossible to draw a meaningful circle, hence it is impossible to draw a darts board. Mr. Elverstone, the author of this program, has got over this problem very nicely by displaying only part of the board at a time. Funnily enough, this does not really detract from the play of the game as one might think it would, for if you visualise youself playing darts you are normally aiming at one particular number and if you have even reasonable skill the chances are that you will hit that number or those adjacent to it. The author has been extremely clever in incorporating into the game a certain amount of user skill in the actual throwing of the dart. We will not go into details in this sales description of the techniques used, but it seems to us that the game which results gets about as close to playing a game of darts on a computer as it is possible to get.

CHEMICAL FORMULAE — AND HOW TO WRITE THEM

This program is a straightforward educational one to enable you, your children or your pupils to construct and write chemical formulae. It makes use of graphics to construct letters (both upper and lower case) which are displayed on the screen together with the charges of the ions. Ions may be added or subtracted until the total charges have been balanced. The computer will then display the correct formulae for the chosen compound using brackets and descending numbers as required. Assuming the use of a 26" television screen, the ions and formulae are readable across a normal sized classroom. The program, which has been written by Mr. T. Randall, an experienced chemistry teacher (and, incidentally, the author of Elemental Maze), may be used either by teachers as a demonstration, or by individual pupils to help with particualr problems (for instance, when and where to use brackets) and finally by pupils at home for revision and practice. A useful educational program which performs a useful function.

BOOKS

For some time we have had to fight a rearguard action in attempting to keep our policy of just selling software. From time to time we have been pressured into stocking small items of hardware, particularly the doubler and data separator boards and also occasionally we have been asked by customers to stock more books. Our policy on this subject up until now has been only to stock those books that have a particular practical utilitarian application to the functions of either the TRS-80 or the Genie. Although we intend to continue this, we have been asked to stock a few more books about the TRS-80 because apparently they are not all that easy to obtain from booksellers. Accordingly the following titles have been added to our range. We would like to point out that the prices of all books are listed in the index under the title ''Books''; they are not referenced under their individual titles.

LEVEL II BASIC

This is a well known book which is on sale in Tandy shops. It starts by guiding you around the hardware. We do not feel that there is an awful lot more in these dozen or so pages than is contained in the TRS-80 manual. However, the second chapter entitled ''Getting Started'' starts by saying ''now the fun really begins ...'' and the next 330 odd pages take the reader through Level II Basic on a step by step basis, rather reminiscent of the Model I Level I manual by David Lien. The text is quite entertaining from time to time and it does contain a self-teaching aspect in that questions are asked almost continuously throughout the book. Probably a fair description of it is that as a self-teaching guide it does take you one step further than the Model I Level II manual and, relevant to that, has two applications. One, if you find the Level II manual difficult to understand, or you do not think it goes far enough, then this book is probably your next step.

MORE TRS-80 BASIC

This book is by the same author as the one above and is essentially a continuation. It is also a self-teaching guide with plenty of questions to prompt you. Of particular interest are two chapters on cassette files and a further two chapters on disk operation and disk files. Graphics and animation are also highlighted. For those readers who are not too well up on memory allocation and usage the second chapter is entitled ''A Guided Tour of Memory'' and is exactly that. During the tour it explains the PEEK and POKE statements and should contain a little of interest for almost everybody.

MY MICRO SPEAKS BASEX

This book is an in depth examination of Basex which is a versatlie new language for 8080 and Z80 type micropcomputers. It is said to combine the best features of Basic and executable machine language code. The major advantage of Basex is speed. Programs can run

up to 10 times faster than similar programs written in Basic. Furthermore, in that Basex programs are more efficient than Basic, they should use less space in memory than would a similar program in Basic. Basex does not seem to be terribly hard to learn, it is essentially a combination of assembly programming and Basic or Fortran. The book starts with short simple programs and progresses to more complex ones in later chapters. Each command is introduced with a straightforward, easy to understand example and exercises are contained in every chapter to test the reader's understanding. Basex has been implemented on a number of machines, but, of course, the version for the TRS-80 is highlighted in this book. At the time of going to press, there is one unfortunate snag and that is that although the book is now in stock, the compiler tape is not yet ready from the publishers. They have promised this to us for February 1982 and we must say that in the past their reputation has been good. It may, therefore, be rather a good thing to be able to buy the book first and get used to the architecture and structure of the language before actually using it. Although we cannot, of course, commit ourselves until the tape is in stock, we would expect to be selling at quite a reasonable price, around £20.

THE TRS-80 MEANS BUSINESS

This book is written by Ted Lewis of Oregan State University and comprises an in depth study of the TRS-80 in business applications. It is thought to be the first guide to the Tandy TRS-80 Model II designed specifically for business computer users. It details everything from selecting the right system for individual requirements to programming the TRS-80 in Basic. A wide variety of applications in areas from wages to accounts receivable are discussed. Aspects of file structure programming are described in as easy a fashion as possible and the book seeks to highlight the use of simple explanations of technical phraseology. The criticism that we have of it is that it is written by an American, presumably for Americans, although to our mind this does not detract very seriously from its utility to a U.K. user.

PROBLEM SOLVING ON THE TRS-80 POCKET COMPUTER

This, we fear, is our sole attempt to support the pocket computer as unfortunately we rightly or wrongly do not supply software for it. This book is written by Don Inman, a co-author of TRS-80 and More TRS-80 described above. Mr. Inman is a Professor of Mathematics and we feel that this probably shows through his treatment of the pocket computer. What he seeks to do, and succeeds in doing, is to show pocket computer owners how to solve virtually any problem using their computer. This book is written in what the publishers call a lively and engaging style and it probably is just that. It essentially teaches problem solving techniques using the pocket computer in step by step fashion. A large range of eductional and practical applications are described. Easy to follow demonstration programs familiarise users with the machine's own form of Basic, its keyboard, memory, editing and programming features. Working appendices give essential information on Basic statements and commands, special Basic functions, abbreviations for statements and commands, together with error codes. Like the other books we have mentioned, it is along the lines of a self-teaching guide.

SUCCESSFUL SOFTWARE FOR SMALL COMPUTERS

This book is not for the beginner. Its sub-title is "Structured Programming in Basic for Science, Business and Education" and it is towards structured program design that the book is aimed. The author assumes a knowledge of Basic and devotes the book to program design techniques, particularly structured programming. The emphasis throughout is on reliable design techniques. A criticism of the book is that it tends to concentrate on a comparatively small number of applications, mostly scientific. They are, however, important ones and to a large extent are used mostly as examples to give effect to the underlying theory of structured programming. The subjects covered are many and varied. We were particularly impressed with the chapter on dynamic data structures, that is to say, the linking of lists. The book has apparently been approved by Tandy for the TRS-80 Level II.

USING CP/M

This is another self-teaching guide and is probably a book that is quite widely needed in the marketplace. It certainly has helped us with a number of aspects of CP/M. There are many, many arguments back and forth about whether or not one should use CP/M as a disk operating system, but whatever the pros and cons may be, there is no doubt whatever that the original documentation issued by Digital Research is, to say the least, technically orientated. No doubt everything is in it, after all there are some seven manuals, but we have always had the greatest of difficulty in understanding what the manual author was talking about. The book starts from the ground up, describing CP/M programs, the architecture, disk drives and booting. It then goes into a chapter on the CP/M commands followed by one on 5 or 6 individual commands. After a chapter on transient programs, the following 5 or 6 are dedicated to the major utilities such as PIP and STAT. Machine exercises are contained with all chapters. If you know little or nothing about CP/M and wish to learn about it, then we would recommend this book to you.

PROGRAMS FOR BEGINNERS ON THE TRS-80

This book takes 21 sample TRS-80 programs and, against a background of the Model I, both Levels I and II, and the Model III, illustrates how the programs work. Various program techniques are described, line by line, within the programs. It should be emphasised that the author assumes that the reader has had no past experience in either computers or programming and, as he says in his preface, "It is not my purpose to teach you what the Basic language is, but to show you how to use the essentials of the Basic language". Most of the programs are designed to run in 4K RAM in either Level I or Level II. A few screen photographs are used throughout the book which are of use.

DATA FILE PROGRAMMING IN BASIC

This is an extremely useful book which takes one aspect of Basic programming and explains it very thoroughly. The subject is data files and programming to get the best out of them. This is an area that often gives people trouble when they are writing data processing programs. We can do no better really than to quote from the back cover of the book as follows. "Using the most popular variants of Basic — TRS-80 Basic and Microsoft Basic-80 (with a special appendix covering Northstar Basic) — this clear, non-technical book leads you at a comfortable pace through each step involved in data file programming and maintaining data files, with dozens of sample programs and practical advice to smooth your way. You'll learn how to use the disk file capability of your microcomputer to keep track of billings, customer inventory and expenses, to catalogue material and maintain mailing lists, to process numerical and statistical information, and much more. And you'll be able to write your own programs, modify commercial programs you've purchased, even adapt programs using data files you've found in computing magazines, to fit your specific needs. All you need is an elementary knowledge of Basic, access to a computer, and this unique, self-paced text."

HINTS AND TIPS FEBRUARY 1982

Normally we try to keep this column to hints and tips which we pick up from our customers or during our own time slaving over a hot computer. However, we recently read an article in the Chicatrug News to do with the INKEY routine that was so good that we considered it was worth devoting the entire column to. It was written by Bill Smythe entitled ''FAST INKEY'' and is as follows:
''Every writer of user-orientated programs is aware of the pitfalls of accepting keyboard input in BASIC. The INPUT statement accepts any keyboard character, including commas (?EXTRA IGNORED), letters when only numbers are appropriate (?REDO), the down-arrow (no error message, but a thoroughly messed up display), and the ENTER key even before any other key has been pressed. To get around these problems, many programmers use the INKEY$ function, bringing forth howls of protest from users who can type faster than the INKEY$ routine can keep up with. Well, Virginia, INKEY$ doesn't need to be all that slow. Let's write a routine which will force the user's input to be between 1 and 20 characters long (no empty strings allowed) and which will disallow all control codes including the down-arrow. For good measure, let's not allow the first character to be a blank either. A typical INKEY$ subroutine might begin: 30000 J$ = INKEY$: IF J$ = '''' THEN 30000ELSE PRINT J$; Hold it right there. A statement like THEN 30000 takes a long time to execute, especially if line 30000 is near the end of a long program. BASIC must first convert 30000 from decimal to binary, then search through the entire program to find line 30000. This process is carried out each time INKEY$ is empty, i.e. whenever no key is pressed. By the time time BASIC has found line 30000 again, the typist may be way ahead. Roll out the red carpet for our first improvement: 30000 FOR Z = 0 TO 1 STEP 0 : J$ = INKEY$: IF J$ = '''' THEN NEXT ELSE PRINT J$; This version, like the first, waits for a key to be typed and then puts it in J$. FOR Z = 0 TO 1 STEP 0 : NEXT is a much faster endless loop than 30000 GOTO 30000. Now let's embellish the line so as to disallow the down-arrow, ENTER, and backspace: 30000 FOR Z = 0 TO 1 STEP 0 : J$ = INKEY$: IF J$ < ''!'' THEN NEXT ELSE PRINT J$; The ''!'' is in there because it has the lowest ASCII code (33) we wish to allow. Blanks (32), ENTER (13), etc. will not be accepted. This is appropriate for the first character, but after that we must begin to allow these options. Add the following line: 30010 for Z = Z TO 18 : I$ = INKEY$: IF I$ > CHR$(31) THEN PRINT I$; : J$ = J$ + I$: NEXT ELSE IF I$ = CHR$(8) THEN PRINT I$; : J$ = LEFT$(J$,Z) : IF Z < > 0 THEN Z = Z - 2 : NEXT ELSE 30000 ELSE IF I$ < > CHR$(13) THEN Z = Z - 1 : NEXT ELSE RETURN. This will take care of the next 19 characters (there are 19 numbers between 0 and 18 inclusive). Going into this line, Z = 0 because of line 30000. Thus, FOR Z = Z... is the same as FOR Z = 0... But what's that slow ELSE 30000 doing there? Well, you can't have everything. Besides, that clause gets executed only if a backspace (CHR$(8)) is typed, and then only if the character backspaced is the first character being input. But just a cotton-pickin' minute. BASIC takes time to figure out CHR$(31), CHR$(8), and CHR$(13). It would be better just to use the character itself, in quotes. For example ''A'' is better than CHR$(65). Unfortunately, codes 31, 8 and 13 are Clear, Backspace and Enter, respectively, and you can't type these into a BASIC line. Oh, yes you can, but it must be done in CHANGE submode of EDIT mode. First retype the line like this: 30010 FOR Z = Z TO 18 : I$ = INKEY$: IF I$ ''%'' THEN PRINT I$; : J$ = LEFT$(J$,Z) : IF Z THEN Z = Z - 2 : NEXT ELSE 30000 ELSE IF I$ > ''%'' THEN Z = Z - 1 : NEXT ELSE RETURN.The three percent signs are temporary. Type EDIT 30010 ENTER then Search for a % sign by typing S and %. Change it to a code 31 by typing C and then Clear (don't argue, just do it — it works fine). Now Search for the next % BY AGAIN TYPING S and %, then change it to a code 8 by typing C and then Backspace (what? — this works too??) Another S and %, then C and ENTER to change the last % to a code 13 (this is getting ridiculous). Hit ENTER one last time to get out of EDIT mode. Line 30010 now has hidden characters in it, especially in the vicinity of the backspace character, which makes the two quotes look like one. Confusing, but it'll run faster. By the way, I snuck one other change into 30010 too — IF Z < > 0 was replaced by IF Z. This is called ''logical arithmetic'', and if it doesn't seem logical, just take my word for it. Well, that takes care of the 20 actual characters. For our 21st ''character'' we want to accept only the ENTER or backspace keys. One last line will do the trick: 30020 FOR Z = Z TO 20 STEP 0 : I$ = INKEY$: IF I$ = ''%'' THEN PRINT I$; : J$ = LEFT$(J$,Z) : Z = Z - 1 : GOTO 30010 ELSE IF I$ < > ''%'' THEN NEXT ELSE RETURN. After typing the line, use the method described above to change the first percent sign to Backspace and the second to ENTER. The slow GOTO 30010 gets executed only if the last character in the input line is backspaced; in that case, Z has the value 18 when line 30010 is GOne TO. (That explains why I said FOR Z = Z instead of FOR Z = 0 in 30010). If you have been following all of the suggestions so far, you have probably found that this subroutine still isn't very fast. That's because I'm not through yet. NEW out everything and type in the following program:

```
10 CLEAR 50
20 DEFINT Z
30 DEFSTR I-J
40 CLS
50 PRINT ''Enter something:''
60 N = 20
70 GOSUB 30000
80 PRINT
90 PRINT ''Your something was '';J$
100 end
30000 PRINTCHR$(14);:I = INKEY$:FORZ = 0T01STEP0:
J = INKEY$:IFJ  ''!''THENNEXTELSEPRINTJ;


30010 FORZ = ZTON-2:I = INKEY$:IFI  ''%''THENPRINTI;:
J = J + I:NEXTELSEIFI = ''%''THENPRINTI;:J = LEFT$(J,Z):
IFZTHENZ = Z-2:NEXTELSE30000ELSEIFI  ''%''THENZ = Z-1:
NEXTELSEPRINTCHR$(15);:RETURN
30020 FORZ = ZTONSTEP0:I = INKEY$:IFI = ''%''THENPRINTI;:
J = LEFT$(J,Z):Z = Z-1:GOTO30010ELSEIFI  ''%''THENNEXT
ELSEPRINTCHR$(15);:RETURN
```

DEALERS

This is a list of our TRS-80 and Video Genie Dealers

ABC Supplies, Manchester.

Advance Television Services, Baildon, Shipley.

Anglia Computer Centre, Norwich.

Ashford Computer Centre, Ashford.

Audio Visual Ltd., Glasgow.

B.E.C. Computer World, Liverpool,

Bennetts, Dereham.

Bits & Bytes, Barnstable.

Brittain Labs, Belfast.

Briers Polytechnic Bookshop, Middlesborough.

Cambridge Micro Computers, Cambridge.

Cavern Electronics, Wolverton.

Chromasonics Electro, Junction Rd., London.

Computer & Chips, St. Andrews, Fife.

City Microsystems Ltd., London Wall, London.

Croydon Computer Centre, Thornton Heath.

Comprite, Laisterdyke, Bradford.

Computer Shack Ltd., Cheltenham.

Consultant Electronics, Erdington.

A. E. Chapman, Cradley Heath.

Computer User Aids, Romford.

Chrysalid Systems & Software, Berkhampstead.

Cambridge Computer, Cambridge.

Comp Shop Ltd., New Barnet.

Comp Shop Ltd., Edgeware Rd., London.

Comp Shop Ltd., Dublin 1.

Computer Supplies Ltd., Swansea.

Crofton Electronics, Twickenham.

Cumana Ltd., Guildford.

Cardata, Acomb, York.

Diskwise Ltd., Callington.

East Midlands Comp. Service, Arnold, Nottingham.

Esco Computing Ltd., Glasgow.

Everyman Computers, Westbury.

Ely Electronics, Glenfield, Leicester.

Elgelec Ltd., Ipswich.

Emprise — Tandy, Colchester.

Frank Cody, Staines.

Fareham Computer Centre, Fareham.

Gamer, Brighton.

Gamer, Brighton.

G.B. Organs & T.V., St. Saviour, Jersey.

Gen. Northern Micro Comp., Blackhall, Hartlepool.

G.M.B. Computer Services, Castle Donnington.

Harden Microsystems, Blackpool.

J. Hepworth & Sons Ltd., Leeds.

H.R. Control Systems, Chorley.

Huddersfield Amat. Rad. Shop, Huddersfield.

O. & J. House Ltd., Blandford Forum.

Kray Electronics, Leicester.

Leisuronics, Blackpool.

Lowe Electronics, Matlock.

3 Line Computing, Hull.

Mansfield Computers, Mansfield.

Microdigital Ltd., Liverpool.

Micro-Print Ltd., Stoke on Trent.

Microstyle, Bath.

Midland Microcompute, Nottingham.

Morriston Computer Centre, Morriston.

M.R.S. Communications, Whitchurch, Cardiff.

Midshires, Crewe.

Micro Business Systems, Witney.

Microcomputer Services, Clacton on Sea.

Microware Computing Services Bristol.

Optelco, Rayleigh.

Personal Computer Palace, Reading.

Photo Acoustics Ltd., Watford.

Photo Electrics, Sheffield 2.

Parkstone Electrics, Poole.

Plant & Equip. (London) Ltd., Rowsley, Nr. Matlock.

Peterborough Electronic Store, Peterborough.

P. & J. Equipment, Guildford.

Q-Tek Systems Ltd., Stevenage.

R.D.S. Electrical, Portsmouth.

Scott Jackson Elec. Serv. Ltd., Ryde, I.O.W.

Surrey Microsystems, Wallington.

Silicon Centre, Edinburgh.

S.M.G. Microcomputers, Gravesend.

Sound Service, Burnley.

Superior Systems Ltd., Sheffield.

Swanley Electronics, Swanley.

Systems Selections, Clydach.

Tandy Store, Croydon.

Tandy Store, Gloucester.

Tandy (Hastings), Hastings.

Tryfan Computers, Bangor.

Ward Electronics, Handsworth, Birmingham.

Wason Microchip Ltd., Fore Street, London.

Zeta Computers, Stonehouse.

FOREIGN

U.S. [Distrbutors]
Adventure International, Florida.

Logical Systems, Mequon.

Acorn Software Products Inc., Washington.

France
Graphie, Montreuil.

Germany
Computer Service, 6842 Burstaot 1

Holland
Software Import Brabant, Eindhoven.

Computercollectief, Amsterdam.

Sweden
L.S.I. Electronics A.B., Stockholm.

New Zealand
Data Link Ltd., Wellington.

Italy
Genius Computers, Vicenza.

Spain
Lydesa Laboratorio Y Disenos Electronicos S.A., Madrid.

Karnak Electronics, Barcelona.

South Africa
Marshall International, Johannesburgh 2000

Canada
J. & J. Electronics, Manitoba.

APRIL LISTING

ARROW OF DEATH PART 2 — THE FOURTH MYSTERIOUS ADVENTURE

Brian Howarth has now completed the second part of the Arrow of Death. Having successfully completed the first part, the intrepid Adventurer is in possession of the component parts of an Arrow. These he will need in order to destroy Xerdon the Evil, the source of the ill which has befallen your homeland. You now find yourself on the fringe of Desolation Marsh with no clear idea about what to do next. The main objective is to seek out the only man able to create a Magical Arrow from the parts which you now possess. This man is Arnid, the royal fletcher. However, he has been kidnapped by the minions of Xerdon the Evil who have somehow learned of your intent. Hence you must set off in search of Arnid. Danger lurks at every step and your only hope of survival on this quest is to rely on quick wits and cunning!

ESCAPE FROM PULSAR 7 — THE FIRST SPACE MYSTERIOUS ADVENTURE, NUMBER 5

Brian Howarth's well known imagination has now taken wings into space. You, the Adventurer, are alone . . . or almost alone on the space freighter ''Pulsar 7''. As you sit in the relative safety of the social room, your thoughts drift unwillingly back to the day two weeks ago when the nightmare began . . .

It started out as a routine mission, an exploratory flight into the outer regions of the Xanotar system. The purpose of the mission was, as always, to deliver the precious ore Redennium to minor planetoids whose civilisations had evolved beyond primitive nuclear power and were seeking out new methods of energy transferrence from common elements found on their home planets. Redennium was rare in these far flung regions of the Xanotar system, consequently most governments of these planetoids were only too eager to accept samples of new elements, particularly Redennium whose energy transferrence characteristics were second to none. After successfully trading the current load of Redennium and also receiving as part payment for the consignment a strange but interesting creature for the intergalactic zoo on your home planet, you and your crew set course for home. Initially the trip was uneventful except for a minor disturbance when the creature broke out of its cage and took to rolling about playfully in the remains of the Redennium ore left in the cargo hold. After recapturing the creature and placing it back in its cage, the Pulsar 7 resumed its monotonous course for home. In the following days, however, the creature became restless and began to grow at an astonishing rate. It was decided at this point that the creature was likely to become a danger to the crew and should therfore be sedated and placed into suspended animation for the remainder of the journey home. The decision came too late. The creature, now the size of a small horse, had ripped open its cage and savagely killed and eaten two of the crew members. It had concealed itself somewhere aboard the gigantic freighter. Since then the creature had accounted for all of the remaining crew except yourself. Your only option now is to abandon the freighter and attempt to make your escape in the frail shuttle craft . . . if you can avoid the deadly creature!

MEMDISK — ADDITIONAL DISK TYPE STORAGE

One of the less attractive Americanisms is the expression that something ''is the greatest thing since chewing gum''. It is not a saying that one uses very much, but it does have a certain ring about it when describing something very new, very attractive and extremely useful. In this instance we will break our rule and categorically state that Memdisk **is** the greatest thing since chewing gum. Memdisk literally creates a disk drive type storage in RAM. Let us get its least attractive point over first. Obviously, storage is limited. In actual fact, the authors of Memdisk have, if not got over this point, certainly made it as usable as possible by putting in a feature whereby it is possible for the user to define the amount of RAM that he will use for his ''disk drive''.

The idea of having a disk drive inside your memory is not, incidentally, a new one. It is used in many main frame computers but, as far as we know, this is the first program which has become available for the TRS-80 and Video Genie which will perform this function. At first sight it might be thought that it would only have application for owners who at present have single drives. As a matter of fact, this is not so. We have been using it for some time now, and find that it is equally useful in twin drive systems as in singles. The beauty of Memdisk is that the ''drive'' can be accessed with normal disk drive commands, such as ''COPY'', ''BACKUP'', ''FREE'', ''DIR'', ''SAVE'', ''LOAD'', ''DUMP'', etc. Perhaps the first of these commands will be the one most used by single drive owners, because they can insert a disk into their drive, copy a file on to the ''drive'' in memory, change disks and copy it back to the actual physical drive. Another major advantage of a Memdisk drive is that without a doubt it is faster than any floppy drive available and as a matter of fact it is even faster than many hard disk drives.

As we have said, the chief limitation is that there is only a certain amount of RAM available. Thus, the maximum amount of storage usable is 27K. The minimum is 1.5K. Thus, any portion of memory within this range may be defined as a disk drive. Each Memdisk track will consist of 6 granules. The track size is adjustable with one or two sectors per granule. Thus a track will take 1.5K or 3K, depending on the number of sectors per granule you select. The user is allowed up to 19 single sector per granule tracks or up to 9 two sector per granule tracks. Using two sector per granule tracks will provide 80 directory slots, but 16 of these are reserved for System files. When using one sector per granule tracks, the directory space is limited to 32 files with 8 reserved for System. An interesting point is that, space allowing, one can construct several ''drives'' at one time in memory. Obviously space is very restrictive but two drives in memory would be practical. The maximum would be seven but they would be of little use!

Memdisk is only available for the TRS-80 and Video Genie because of the superior facilities contained in LDOS. Hence it is only with that system that Memdisk may be used. Interestingly, the Memdisk drive may be automatically booted with the LDOS SYSTEM (SYSGEN) feature. Finally, just to emphasise that Memdisk involves no additional hardware of any sort. Apart from the obvious economic advantage, it should be borne in mind that the user will have nothing to align, clean, or break! Should there be anything wrong with your RAM, by the way, Memdisk will not load. It does a quick diagnostic prior to installing itself!

SBT — STRUCTURED BASIC TRANSLATOR

This program was introduced by us some couple of years ago in England and although it has been a steady seller, we have often felt that it has not really received the attention which it deserved. It is used widely in the United States and we thought it might be helpful if we included some sales chat which is used over there. The renewed interest in this program, incidentally, is because it is now available for the Model III as well as the Model I. For what it is worth, the sales extract is as follows: —

> ''you are about to enter a whole new world of computer programming. No longer will you be lost in a confusing sea of line numbers, GOTOs and GOSUBs. No longer will you repeatedly type subroutines that you use often. Instead, you will begin to program in a clear, straightforward manner, a structured manner that yields source programs that will be as easy to understand five years from now as they are when you write them.
>
> Structured Basic Translator allows you to develop this new way of programming — actually a new way of thinking — without having to learn a whole new language. SBT utilizes the features of Basic that you already know and provides a means to make program writing and documentation clearer and more efficient. SBT is not a programming language; it is simply a utility which allows you to write structured programs using SBT ''structures'' called PROCEDURES, CALLS, CASE-CALLS, IF-THEN-ELSE, WHILE and UNTIL. Using the editor, a program is written without line numbers, GOTOs or GOSUBs. The completed program is placed in a disk file, or files, which SBT will convert into an executable Basic program. Before reading further, please note that SBT is not designed for beginner programmers. Rather it is a means of untying the hands of relatively proficient Basic programmers. SBT is designed for compactness and speed: it will translate its own source code in less than five minutes on most systems. The translator is fast enough that you will never hesitate to modify your source code due to fear of a long translation process.''

MORE SOFTWARE FOR THE TANDY COLOUR COMPUTER

SIGMON — MONITOR FOR THE COLOUR COMPUTER

Let us get one thing straight right from the beginning. The TRS-80 has been around for about four years, as also have a variety of other microcomputers. Accordingly, when we nowadays think of a Monitor, our mind goes to a very sophisticated piece of software resulting from 4 years or more development. The Colour Computer is very new and although we do not wish in any way to downgrade this Monitor, we must in fairness say that it does not have many of the more sophisticated features to which we may have become used. The other side of that particular coin is rather unusual. The source code for the Monitor is supplied in the package, so it can be modified, if not with ease, certainly by a moderately skilled assembly programmer. SIGMON consists of 4 sections as follows: —

MONITOR: With the Monitor section you may display memory in Hex or ASCII. Hex or decimal may be entered in to memory/registers. Memory may be moved in blocks from one address to another and data may also be found in memory. Machine language tapes may be read and they may also be written. Printer output is available.

DISASSEMBLER: This is similar to a standard disassembler and displays the address, the Opcode, Operand, Mnemonics and Address expressions for a specific range of instructions.

MINI ASSEMBLER: This utility is effectively a memory editor with the ability to translate mnemonics. Thus it is possible for instance to enter the command ''3000 = 'This is a test' '' which will enter the text starting at address 3000. Mnemonics are entered one to a line so that ''3002 = 'BRA$ 3010' '' will enter that instruction into memory. Do not forget of course that the Colour Computer uses the 6809 Microprocessor rather than the Z80 hence the mnemonics are somewhat different. The package incidentally comes with an instruction set summary put out by Motorola.

DEBUGGER: The Debugger allows Stepping and Breakpoint execution of Machine Language programs. Registers are displayed before and after each step of the program. Nine Breakpoints are permitted. Tracing is permitted in ROM but you are given the option before entering it, for if the Debugger hits an RTS instruction it will wind up back in Basic.

There are one or two commands that we have not listed. The SET will allow you to assign values to any of the Registers and GO is available so that you may go to the program entry point and execute. The SPEED command will set the video scrolling speed. PLOAD will load data from a port. And finally, there are commands to control printing output.

S.E.C.S. — SCREEN EDIT CONTROL SYSTEM

S.E.C.S. is a collection of three programs for use on the TRS-80 Colour Computer. Despite the fact that one of the programs is called ''High Resolution Graphics'' it may be used on the Extended BASIC machine for as you will see shortly, this section is required for the Character Generator. The three sections are as follows: —

FULL SCREEN EDITOR: Before we forget to mention it, this is the only part of the program that can be used on a 4K machine. Its purpose is to add various enhancements to the Basic Interpreter which effectively patches so that when the Editor has been loaded it is transparent to the user. It does not, however, ''patch'' in the sense of a disk operating system. That is to say the program is run once, patches, and then is not used again. indeed , of course, this would be impossible because the Interpreter is in ROM. After the Editor is loaded the new cursor will be displayed and the operator can commence to either load or enter the material which he wishes to edit. The cursor is moved around the screen with one of the 4 arrow keys. The editing commands available are to Insert, Delete, Join Lines, and Relocate Lines. Two additional features are an auto repeat and audible error warning.

HIGH RESOLUTION GRAPHICS: It is difficult to say really that this section of the suite enhances the interpreter because Extended BASIC of course already has High Resolution Graphics capability. You may find that this add on, however, is easier to use, and as we have already said it is essential before the High Resolution Character Generator is operated. With this graphic enhancement you can choose between four separate modes of High Resolution and switch back and forth. The screen may be inverted and Colour, Line and Screen may all be set. A programmable character may also be set.

HIGH RESOLUTION CHARACTER GENERATOR: To our minds this is the most useful part of the suite with the possible exception of the Full Screen Editor. 64 characters may be defined and they may all be saved or loaded to and from tape. Characters, after definition, may be placed on the screen in any colour and in any position. In other words once the characters are established they can be placed on the screen in a large variety of colours and positions. Furthermore, these characters may consist of anything from classical Japanese characters to advanced scientific notation!

PAGE FILE — AN ELECTRONIC BOOK

There are many different types of databases on the market. Some, like ISS, are aimed at a very fast sort. Some, like Maxi Manager and CCA are aimed at a more general market. Page File falls somewhere between the two. It is to some extent a specialised database in the sense that its format is quite unique. On the other hand, it can be used for general purpose storage of data. The title ''Page File'' is an extremely descriptive name for a program which essentially is a book of pages, each of them constituting a file. If you can imagine a loose-leaf binder upon which you can at will write whatever you wish and then turn to another page and write something else, turn back if you wish and see what you had previously written, and so on, then you are getting pretty close to an understanding of Page File. Its beauty and its uniqueness has to be an entire format of the file.

Provisions, of course, are made to search the book. All one does is to enter in the alpha-numerical word or collection of characters required and instruct the search. It will then come up with the first occurrence and you may then proceed to further occurrences if the first one was not the one that you were after. An important feature is that the search is of an INSTRING nature, that is to say, part of the word may be entered to find a full word. As always with these INSTRING searches, however, do not make the string too short or it will stop at every word. The editing features are quite comprehensive. First of all, a page may be deleted, in which case, of course, it will leave a blank screen for that page. This may be filled up with other data just as an ordinary page in a book. Incidentally, we should have mentioned before that when you are writing your page you have facilities for tabbing.

The next editing feature is that there is a type of re-pagination, that is to say, if you are on, for instance, Page 4, you can re-number that page to Page 10. The program will not incidentally let you over-write the exisitng page without warning you of the dire consequences thereof. The page that you have left, in our example, Page 4, becomes a blank page. The next editing feature is the ability to insert. This is somewhat similar to the method that we have just described, but instead of simply over-writing the target page, the program moves the intervening pages up one, to make room. Thus if we were to insert Page 7 on Page 4, Page 4 would become Page 5, Page 5 would become Page 6, and Page 6 would become Page 7. One useful application and example of this function would be if, for instance, Pages 2-5 contained your address list and Page 6 is the start of vegetable garden plans. Your address list is full and you need to add more entries, in other words you need to slot in an extra page following Page 5. So long as your book is not full, you simply take a blank page from the end of the book and insert it at Page 6. Your list now runs from Page 2 to Page 6 and your garden entries begin on Page 7. Just in case there should be any misunderstanding, the move above was of a blank page to give one further space in the address list. There is another command which will allow the exchange of pages whether they be blank or otherwise. In other words, a full Page 7 may be swapped with a full Page 4, whereupon 4 becomes 7 and vice versa. We have, in the description of the editing mode, really left the best until last. The COPY command allows one to copy one page to another. Although at first sight this does not appear to be important, a little thought will see how useful it can be. Think, for instance, of a programming aid. Various companies sell charts to aid in basic programming. With Page File it is only necessary to construct such a chart once. It can than be copied to other pages and if one wished, one could have a book full of basic programming charts. It is not difficult to think of other uses. Essentially, whenever you need a duplication, use COPY. In case you may think that this is a dull book, you must think again, because the author has included facilities for drawing diagrams, pictures, borders, and indeed any other graphic portrayal within the capability of the machine. Once again, one should give this a little thought, and when combined with the previous mentioned command of COPY, it has obvious advantages in many many different trades or professions, but even apart from this utilitarian application it is, as they say, fun for all the family. With the command graphics mode the cursor is set in the centre of the screen. It is moved around by using the numeric keypad. As these keys

are, of course, wired in parallel to the normal keys at the top of the keyboard, these keys may be used if you do not have a keypad. Without a doubt, however, the keypad does make life a little easier. If, as you move the cursor, you hold down a certain key, you will draw a line and the same facility is available for erasing an existing line. The graphics cursor erases any text characters, so if you have a mixed page, then it is better to do the graphics first and then insert the text.

JUNIOR UTILITY — NOW ON DISK

Elsewhere in the catalogue is described the Junior Utility which is a comprehensive two pass disassembler. Up until now this has only been available on tape, but we are now able to supply a disk version. This, incidentally, is otherwise known as the Misosys Disassembler. It was written by Roy Soltoff who also wrote EDAS, the Editor Assembler again mentioned elsewhere in the catalogue. This disk disassembler is mentioned in the EDAS instructions.

FLIGHTPLAN — FLIGHTPLAN FOR LIGHT AIRCRAFT PILOTS

The first thing to be emphasized about this program is that it is written by an English pilot, hence the data which is stored in the program is relevant to England. The function of the program is a straightforward one. It will produce an accurate flightplan of up to 8 waypoints for light planes. An important feature is that it can use data for airfields and beacons either from its stored data statements, or from data input by the pilot at the keyboard, or from both. The author has included in the instructions guidelines on the method of changing the waypoints in the data statements. Thus, additional or alternative waypoints may be stored to suit any particular pilot. Information will be required for each waypoint and will consist of its name; latitude in degrees and minutes plus direction; longtitude in degrees and minutes plus direction; magnetic variation direction and magnetic variation angle. Use of the program is nice and simple. The first piece of information to be input is the number of waypoints. These will include the departure and destination and up to six others. You will then be asked whether you wish to use one of the stored waypoints for the departure point. If the answer is affirmative, you will of course have to name it. A nice convenience feature here is that you can type 'L' in order to examine the list of stored waypoints. If you do not intend to use the stored data then you will have to enter the information for whatever one you are going to use. This consists of the name, the latitude and longtitude and of course directions, thus 51, 33, N. Magnetic variation must also be entered. When all of the waypoints have been entered, the wind vectors should be inserted together with the true airspeed plus fuel rate and time of departure. Thereafter, the computer will do its thing and you may choose output either to the screen or the printer. Provision is allowed for further copies of the hard-copy which is particularly useful for flying instructors wishing to send more than one student on the same standard navigation exercise. The program uses spherical co-ordinate trigonometry to determine the Great Circle on which the two locations lie. This will produce the shortest distance between any two points on the earth's surface, and is more accurate for long range navigation than is the Rhumb line method. Accuracy does suffer, however, over very short distances. All in all, a very nice and useful program for those customers who are lucky enough to own a computer and use a light aircraft.

BRIGHT AND EARLY — WOULD YOU BELIEVE — IT IMPROVES MATHS SKILLS!

This is a program to instruct children of between the ages of 6 and 12 in the skills of the science of mathematics. There are five individual learning programs in the package with graphics and sound effects. These five programs (again, we did not invent the titles!) are as follows:-

Add-a-pet	Addition drills
The Big Boom	Subtraction drills
Space Man Math	Multiplication drills
Moon Lander Math	Division drills
Basic Math Facts	Flash Card review

The note on the right indicates the function.

These are quite good programs for the youngsters and they will certainly keep them interested in the subject at hand. In the first, one collects pets in a pet shop and thus learns additions. In the second, subtraction skills are honed to a fine edge with the graphics and sound effects of the Big Boom. Multiplication rears its ugly head in the Space Man Math in which a space man is freed from a mountain. Rockets are launched to the moon if the child knows its division rules, and finally basic facts of mathematics are featured in the Flash Card review.

MONEY MANAGER — A PERSONAL FINANCE PACKAGE

Owners of previous editions of our catalogues, that is to say, earlier than the typeset one, will have on Page 24 a program called ''Home Budget''. Although this was quite an extensive piece of software, it was also rather highly priced. We have now replaced it by this present program which in fact has one or two additional features and is of lower cost. Indeed, this is another example of an American program where we are now able to sell the program in England for the same price as it is sold in the United States. Money Manager is a complete management tool for the home budget, helping to keep track of your income and expenditure and providing an easy method of budget allocation. The outgoing money is categorised into accounts that you design according to your needs. It provides a means of keeping complete, accurate records including itemisation of tax deductible expenditure. Information on up to 250 cheques per month can be maintained on a 48K machine. Standing orders or direct debits may be specified and cheques made payable to credit card companies, department stores and similar entities may be broken down so that each individual expense can be categorised. The program of course supports a line printer where formatted printouts may be made by category and time period. The program is menu driven and perhaps the best way of describing the features of the program is to list this menu as follows: —

ADD NEW ENTRIES TO THE FILE	REVIEW CATEGORISED ENTRIES
DELETE/MODIFY CHEQUE BOOK ENTRIES	REVIEW DEPOSITS
REVIEW ANY CHEQUE BOOK ENTRY	REVIEW BANK CHARGES
CHANGE/DISPLAY BALANCE	REVIEW MISCELLANEOUS WITHDRAWALS
PRINT ALL CATEGORISED ENTRIES	REVIEW OUTSTANDING CHEQUES
RECONCILE CHEQUE BOOK	MODIFY/LIST CATEGORIES
REVIEW COMPLETE CHEQUE BOOK FILE	DISPLAY CATEGORY/MONTH MATRIX
REVIEW CHEQUE BOOK FILE BY MONTH	

Finally, we would like to emphasise that the ability to establish your own customised categories reflecting your own needs is one of the most important features of this program. Obviously it cannot decide how much you should spend on what. Indeed, Money Manager is not a budget making program as such, but once the categories have been decided, they could be used to monitor how well you are keeping to your budget.

REFERENCE CARDS

One of the most useful things that Tandy produce are the reference cards which they supply with the Model II, Model III and Colour computers. We cannot speak for other people but even though we are using the machines constantly, we frequently make use of these cards. Tandy have been kind enough to supply us with a quantity which we will pass on to customers without charge. They will no doubt be of most appeal to Model I owners, for, as we have mentioned, they are supplied with the other machines. We are not going to the limits of asking customers to prove that they have a Tandy machine, but are relying on you not to ask for a card unless you do have a TRS-80!

ADMIRAL GRAF SPEE — A WAR GAME ON THE RIVER PLATE

The author says that two intentions lay behind the design of ''Admiral Graf Spee'', firstly to produce an accurate and realistic simulation of the Battle and secondly to include sufficient user interaction so that the player feels he can control all aspects of his ship's situation, except of course for the damage suffered. The history of the Battle of the River Plate is as follows: —

> ''The Battle of the River Plate commenced at 06.14 hours on December 13th, 1939 off the coast of Uraguay, between the German pocket battleship 'Admiral Graf Spee' under Captain Hans Langsdorff and Force G of the Royal Navy under Commodore H. H. Harwood. The significance of the outcome lay not so much in the military ramifications as in the diplomatic effects of a battle fought at the start of the war on the many countries still neutral.
> Although Force G was missing a ship refitting at the Falklands, Harwood decided to attack when the raider was sighted. Two light cruisers (sister ships Achilles of New Zealand, flagship, and Ajax) and the heavy cruiser Exeter were, however, no match for the 11-inch guns of the Graf Spee. Concentrating her fire on the Exeter, whilst holding off Ajax and Achilles with her secondary armament, the Graf Spee soon turned the Exeter into a floating (just) wreck.
> Even though Langsdorff made no attempt to maintain a safe distance to outreach his opponents, and frequently switched targets (so reducing the rate of fire), the Ajax soon lost two turrets and the Achilles was also damaged. No vital damage had been inflicted on the German ship and ammunition was running low aboard the Ajax and Achilles. With the Exeter forced to break off the engagement, Harwood was forced to shadow the Graf Spee into Montivideo harbour at a distance.
> Thinking that a substantial British force was awaiting him in the Atlantic and finding himself in legal difficulties in the neutral port of Montivideo, Langsdorff made arrangements for the Graf Spee to be scuttled in the harbour on December 17th. Shaken by losses to his crew, the loss of his command and the reaction of Hitler (quoted as 'very angry'), Langsdorff shot himself, draped in the German ensign, on December 20th.''

The program is written in Basic and after the program is entered, the initial map display shows the relevant positions of the ships, with the Graf Spee always centrally disposed. General information about the Graf Spee is displayed and exact details of Force G. The initial positions, speeds and headings are based on the historical position at first sight with a random element for each new game. The valid orders include the fire of a Salvo; calling up of the map display; information on the ship; speed and course change; launch torpedos and exit.

SALES LEDGER 1 — A MAJOR NEW ACCOUNTING PROGRAM

It is not often that major new programs come about, particularly in the Accounting field. Indeed, Tridata has almost monopolised this field, at least for the TRS-80, for some time. It is fair to say that Prosoft, the authors of this new software have, as is quite legitimate, benefited from the experience of previous accountancy package authors. In other words a lot of the criticisms which are viable regarding existing accountancy packages have been eradicated in this new Sales Ledger. Also, we should make the point that this product is intended to be the first of a series of interlocking packages. It is compatible with both the Model I and Model 3 TRS-80 and also the Video Genie, Model 1 and Model 2 Genie it requires two disk drives. In the main, our discussions will revolve around the Model 3 TRS-80 machine, but all of our comments will essentially be relevant to the other Microcomputers.
Sales Ledger 1 is a comprehensive and simple to operate Balance forward Sales Ledger which features minimum access to disk and, therefore, high speed operation together with a very high degree of ''user friendliness''. Having studied previous Sales Ledgers the authors felt that one of the major problems was the necessity to be continually swapping disks. This has been kept to a minimum and as a matter of fact if you are running less than 400 accounts no swapping will be necessary. The maximum capacity of a data disk is 400 customer accounts which may contain up to 2030 transactions in any one month. Multiple disks may, of course, be processed up to a maximum of 32 disks. The program disk is normally resident in drive 'O' and the system controls the account range of each data disk, maintaining a record of that account range on the program disk in drive 'O'. This ensures that account numbers cannot be duplicated and that all data disks have been entered through the system as, for example, is required in the Statement production run.
Ease of interface for the operator is a much maligned assertion in software Sales literature but we would like to emphasise this aspect of Sales Ledger 1. The user is guided through every stage of the operation by means of Menus and extensive on screen information. In addition to this prompting from the Microcomputer a comprehensive Manual is provided giving details of all the operations and advice on the type of forms and paper to use. A wide range of error checking has been included so that it really can be said that if you can enter the data into the program it is bound to be acceptable to it.
Prosoft have developed a unique system to guide the operator in every point of input via the screen. They call this IMFSI which is an anachronism for Input Mode and Field Size Indicator. It seems almost obligatory for software authors to complicate matters by using this type of terminology and we would like to emphasise that such ''complications'' in no way reverse the ease of use of this program. For instance, whenever input is required from the operator IMFSI displays a number of light blocks equivalent to the maximum number of characters that can be input for that field. As data is input the light blocks are switched off and if you backspace, characters are deleted and the light block switched back on. Using these little blocks continually tells the operator how much he or she has left for input. A particularly good feature is that at the top right hand of the screen IMFSI always displays an ''A'' or an ''N''. The former indicates that all characters may be input and the latter that only numerical characters are accepted. In addition the operator is informed of the number of characters that may be input.
In other words Sales Ledger 1 starts off with one very big advantage that many other accountancy packages do not have, and that is a complete integration with the user in a friendly and co-operative way. One never feels that one has to battle with the machine, rather, that the machine is co-operating with the often inexperienced operator.
So far as the accounting side of the program is concerned, Sales Ledger 1 supports mixed postings, that is to say, invoices, credit notes, cash/discount, journal debits and journal credits, and with day book production as postings are made. During the postings input the amount of available transaction space for the data disk that is being used, is permanently displayed — another nice convenient feature. The day book is summarised at the batch end with the option to continue posting in the event of the summarised totals not agreeing with a pre-list. Most important for accountants is the fact that automatic batch numbering ensures that audit trails are maintained in strict numerical order. Accounts which extended over the personal credit limit are reported both on the screen and in the day book.
Statements may be produced as interim or Month End. Interim Statements may be produced one off or by range and do not affect the current postings. Options are available to print a 50 character message on each statement and to print the account balance over a period of the current month and 3 later ones. In other words an ageing report. Month End Statements automatically clear down the current transactions and age the balance. Continuation statements are automatically adjusted. The following reports are available: —

a. Age debtors report for all accounts starting at one month old and over and ending at 3 months old and over.
b. Accounts over credit limit, showing account number, name, telephone number, account balance, credit limit and amount
b. over credit limit.
c. Accounts may be listed in either account number order or alphabetical order.
d. V.A.T. Reports, interim, month end and year to date. The V.A.T. report also reports the turnover to date balance and the
d. control account balance.

Options are provided to automatically produce name and address labels (for a two up form) for the following: —

1. All accounts.
2. Accounts one, two or three months overdue.
3. All accounts over credit limit.
4. All customers on each data disk.

As can be seen from the above, this is not only an extremely easy program to manipulate and use, but it also does all of the most commonly asked for options featured in sales ledger programs. We are quite enthusiastic with regard to this new series and we are in the process of having some literature printed. Accordingly, if you require any further details, you have only to ask for this pamphlet.

MEDIEVAL MAGIC – A JUNIOR ADVENTURE?

Some people complain that the Adventures, particularly the English Mysterious Adventure series by Brian Howarth, are a bit hard when it is the first attempt to play such a game. For these customers we are producing Medieval Magic. It is a true Adventure, but lacks some of the intricacies of the more normal type. The literature from the authors in the United States says ''If you've ever been 'turned off' by the perplexity of the advanced games available, here's the Adventure for you!''. We really have not got much more to add to that, it is a fair description.The scenario is along the lines of the earlier Adventures in that the player is a seeker after fortune in an imaginative castle. Gold and precious gems are the prizes for outwitting the dragon and other ghastly apparitions. It is a perfectly good Adventure, but aimed at those who are just starting on such a career!

FILTER PACKAGE – 13 USEFUL FILTERS

One of the important features of LDOS is its ability to access what are called Filter Drivers. The Disk Operating System comes with one or two. The remainder have to be written by the user in Assembly Code. This is sometimes either a chore which the user does not wish to undertake, or may possibly be beyond his capability. This collection of filters has, therefore, been provided and any one of them may be called by LDOS. An interesting feature of this package is that the source code is provided for each filter. Apart from the filters being very useful in application, therefore, the source code gives a great deal of insight into how one should write these little programs. The filters and their descriptions are as follows: –

CALC/FLT: This is a Keyboard filter which will perform Hex/Decimal/Binary conversions and it will also do Hexadecimal mathematic functions of add and subtract.

LINEFEED/FLT: This is an easy one. The filter will either add or remove a linefeed after each carriage return.

LISTBAS/FLT: This filter takes a BASIC program and separates all multi system lines into individual statements and expressions. It is of course entirely a matter of taste whether this is more meaningful to any particular user. Using BASIC all the time, one tends to forget that its line number orientation is quite unique. Authors who frequently use other high level Languages are more used to seeing statements without line numbers. A sample line such as 100FORX = 32TO64:PRINTX;CHR$(X);CHR$(INT (X + (Q*64)/7.5)):FORY = 0TO200:NEXTY:NEXTX after being processed will finish up as

```
100 FORX = 32TO64:
        PRINTX;
        CHR$ (X) ;
        CHR$ (INT (X + (Q*64) /7.5) ) :
        FORY = OTO200:
        NEXTY:
        NEXTX
```

As we have just said, which presentation appeals to you most is purely a matter of taste. Anyway, with the filter active the printouts will be transformed to the second example.

LOWER/FLT and UPPER/FLT: These two filters convert alphabetic characters within the range A-Z to either all upper or all lower case characters.

MONITOR/FLT: This filter will monitor a specified device and display special symbols for all non-ASCII characters. It can be used on any device capable of output and will display non-ASCII characters in the following manner:

(a) Any character less than the value of a space, that is to say, 20H will be displayed as a percent sign followed by an ASCII representation of the character value + 41H. Thus ODH will be displayed as %N; OAH will be displayed as %K, and so on.

(b) Any character greater than 7FH will be displayed as the character 5BH. This will be either an UP ARROW or a LEFT BRACKET depending on your computer and/or your type of output device.

The Monitor filter is particularly useful when it is suspected that control characters not normally visible are being sent to a device.

PAGEPAWS/FLT: This is a rather nice one, if only for the cute name. It is of course pronounced 'Page pause'. Its function is to cause a pause after every top of the form character. It will wait at this point until the 'ENTER' key is pressed.

REMOVE/CMD: This is a utility rather than a filter and it is provided to remove a specific character value from a file. It is essentially a copy utility. It will strip a character out of the file being copied. For instance it might be used to remove the character OOH from a file to be loaded into SCRIPSIT.

SLASH0/FLT: So long as your printer is capable of backspacing, this filter will enable a slashed zero to be printed.

STRIP7/FLT: This filter will strip the high bit off each character passed through the filter. In effect, of course, this converts any characters outside of the ASCII range to ASCII. It may be applied to any device capable of output which makes it rather useful.

STRIPCNT/FLT: This filter replaces any character above 7FH or below 20H with the hash sign (#).

TITLE/FLT: This filter is useful only for the printer and will allow titleing of printed output. The user may enter any title up to 20 characters long which will thereafter be printed after the top of form on every printout. Additional parameters are the date and time which may also be added.

TRAP/FLT: This filter will trap and throw away a specified character each time that character tries to pass through the filter. It may be used with any device capable of output and has a great many applications. The Cursor On character for instance (OEH) causes some printers to either start underlining or to go into the expanded print mode. These can be trapped and removed. Another application would be to remove any 17H characters which sometimes switch the Video into 32 character mode inadvertently when using the RS-232 interface.

XLATE/FLT: This is a translation filter program and enables code translation within the I/O path of any device so as to adapt to non-ASCII peripherals or apparatus requiring special codes. The program adds certain enhancements to the entire operation of LDOS. By providing the user with an easy means of translating data in an I/O channel, greater versatility in ''talking'' to peripheral equipment is achieved. Included on this filter disk are two translation table files allowing for the translation of ASCII to EBCDIC and vice versa. The second table allows for the conversion of the keyboard to a DVORAK keyboard. Users may also create their own translation tables to be used with this filter. For example, printers containing special character sets can be supported by translating unused codes to the special ones. This is perhaps the most complex of the filters and some 6 pages of the documentation (which incidentally amounts to 22 pages) is taken up with it.

MONITOR – MONITOR YOUR INPUT OUTPUT ERRORS

This is a straightforward program in operation, although no doubt somewhat complex in the writing. Like a number of programs nowadays it takes advantage of the sophisticated features of LDOS and is, therefore, only useable with that disk operating system. The purpose of Monitor is to intercept any disk READ/WRITE errors and offer the operator certain options. When an error is encountered, Monitor will display the standard long form LDOS error message. Included in this will be the error number and description together with the file specification in question. The user will then be given a number of options. First of all, to ignore the error. Secondly to re-try the operation again. Thirdly, to continue by returning to the application program, or finally to abort and exit to the normal LDOS READY message. Ignoring the error will cause Monitor to cancel I/O error code and continue with the operation as though no error had occurred. This is useful, for instance, when the error has been due to faulty data on a disk. Ignoring this error may allow the operator to continue and recover further sectors of a bad file. The re-try facility is self-explanatory. The system will re-try the I/O attempt which caused the error. You may continue to re-try as often as you wish. This option is particularly useful when the cause of the problem was the connector between the keyboard and the interface on a TRS-80. Quite often by the time a re-try is made, the intermittent connection will have rectified itself. Choosing the 'continue' option will allow the application program to continue in its normal input output path. Frequently, this will cause the normal error handling of the calling program to take over. This is a useful facility, particularly so when critical programs or applications are being run, and it is important that the I/O path should remain intact or be used in one of the ways described above.

CONV CPM — CP/M TO LDOS TRANSFER UTILITY

In that we support all programs written for LDOS we are stocking this utility. We should point out, however, that it has little application to the TRS-80 machine although it may well have such application to the new Model III Genie, when it becomes available. CONVCPM allows the user to transfer files from certain CP/M diskettes on to an LDOS formatted disk. The CP/M formats supported are standard 8 inch single density and 5 inch single density (Omikron). Note, therefore, that the TRS-80 Model II CP/M is not supported as it is a double density. The reason for this, incidentally, is that all known CP/M versions modified for the Model II have got a similar utility already installed. The utility provides many different parameters from which to choose the type of file to be moved. The file specifications on the CP/M disk must conform to LDOS file specification standard but as these standards are in fact standard in the industry, they should give no difficulty.

FAMILY TREE — TRACE YOUR ANCESTRAL ROOTS

Paper-based genealogies are firstly very susceptible to error and secondly the very nature of the task leads to bits of paper all over the place. Indeed, when you come to think of it, the tracing of a family tree is a natural for a microcomputer. For professional genealogists, the program will cope with multiple family trees, so that charts and diagrams may be prepared for any number of clients. Keeping the family tree permanently on cassette or disk gives complete ease of update to the user. The tracing of a tree inevitably causes many many corrections as additional data is found. When the tree is permanently available on the computer, such corrections may be carried out swiftly and neatly, leading to far less errors. Each record contains an ancestor's name, year and place of birth, marriage and death. Provision is also made for comments and an indication of the person's position in the family tree being traced. Direct ancestors only are accommodated by the program, that is to say, parents, grand-parents, great grand-parents, etc. to the limits of your family history or the computer's memory. Uncles, cousins, nieces and second spouses are peripheral to your family tree. However, you may elect to use the comment area of your ancestor records to include siblings. Once all the ancestor records are inserted into the computer, the hard work is done and the program will display several options as follows: —

a. A three generation ancestral chart may be displayed on the screen, based upon any person you select.
b. A pedigree may be displayed listing a single line of descent (with spouses) for any chosen ancestor.
c. The records may be searched for full or partial names by country, county of birth, marriage or death. Searches may also be
c. carried out by year, decade, or century of the birth, marriage or death.
d. Comments may also be searched for commonalities in whatever characteristics the user has chosen to place in his comments,
d. for instance occupation or religion.
e. Printer output is supported so that a paper version of any chart, pedigree or list which the user creates may be produced in
e. hard copy. For instance, if you want to maintain a printed family tree, this will end laborious paperwork as you add new
e. findings. The computer can produce a full or partial set of fresh ancestral charts each time that you provide it with your latest
e. updates. The ancestors will be numbered automatically and uniquely so that there will be a clear linkage between pages.

As an indication of the capacity, a 16K cassette based TRS-80 or Genie should be able to accept about 50 ancestor records, although this will of course depend upon the length of the names and the comments. A 32K disk based machine should hold 100 records equally easily. Quite a full manual is supplied and this is required because, with a program such as this, instructions as to the entry of data statements which have to be inserted into the program are useful.

SAUCE — NOW AVAILABLE FOR CP/M

It is difficult to reference pages in the catalogue at the moment and will be for a little while because of the change of format, but if you have the old catalogue, on Page 134 you will find a reference and description to a Disassembler for the Model II. This is a full feature Disassembler intended to compliment Edit-80 and Macro 80 running under the Model II TRSDOS. Robert Bradford, the author, has now re-written Sauce so that it is compatible with CP/M running on the Model II. There is very little difference between the two versions and for a description, customers are referred to the earlier description.

PDS — PARTITIONED DATA SETS

We seem to keep on saying this in this present addition to the catalogue but again this is a program which is only possible because of the features of LDOS and hence it is compatible with that system only. Many of the structural features of LDOS are of course completely hidden from the user. This, of course, is as it should be. Essentially a person using a disk operating system is not concerned with how the function comes about, but merely with the result. It is for this reason that our descriptions of LDOS and indeed other complex programs have, as far as possible, kept to a description of the features. Such a course is a little bit of a pity where really sophisticated software is concerned because the technicalities of programming such utilities is quite fascinating. Anyway, the reason that we have gone into this digression is that LDOS does, in two of its System files, already use PDS, which incidentally is not a new technique to computers. They have been used very widely, particularly on mainframe computers for some considerable time. That being so, what are Partitioned Data Sets? Katzan, in his book ''Operating Systems, a Pragmatic Approach'' defined a Partitioned Data Set as ''a data file that is divided into sequentially organised members'', which is probably a prime example of computerese if ever there was one. Let us see if we can translate it into English. It frequently comes about in computer programs and particularly utilities that a given file will take up a small amount of space on the disk. A disk operating system has a minimum space allocation and, therefore, a large number of small files on a disk can fill it up, when in fact almost half of the disk could be blank space. PDS is a method whereby a lot of little files are amalgamated into one bigger one. This has the big advantage of saving valuable disk space, but also means that much faster access times will be available to the user. Now that we are getting into 80-track and double density not to mention double sided drives, any increase in access speed has to be advantageous. A PDS file maintains its own mini-directory inside of itself and thus when a mini file is called, the system goes to this directory to see if it is in the PDS file. Thus in summary the PDS structure has provided a technique for combining separately executable programs into one file.

DISK DIRECTORY — AN ENHANCED PROGRAM

Elsewhere in this catalogue is shown the description of the previous disk directory which we stocked, written by Ken Smith. This program was not compatible with the Model III and we are, therefore, replacing it with the present program which is compatible with the Model I and Model III TRS-80 and of course the Genie machines. In addition to this added advantage of compatability, this disk directory contains a number of added features, whilst retaining the automatic feature of the previous program — that is to say, the facility to add to the disk catalogue merely by inserting a disk into the drive. Probably the biggest new feature is a SORT, whereby the contents of the Directory can be sorted into alphabetical order, although the advantages of this are closely approximated by the program SEARCH facility whereby an Instring type of search can be carried out on the contents of the catalogue. The Directory may of course be updated at any time. So far as capacity is concerned, the maximum number of disks allowed in the directory is 256. A 32K system will hold 752 records and a 48K system 1317. Although this program is compatible with the Model I LDOS, LDOS users are referred to Discator described below.

DISCATOR — DISK DIRECTORY FOR LDOS

In common with other programs in this edition of the list, we must make it clear to begin with that this program is written specifically for LDOS and will only work under that disk operating system. This, of course, is rather handy because all of our other disk directories do not work under that system. Generally speaking, this is a straightforward disk directory or disk catalogue. It creates a file, surveys other disks, takes the necessary information off, files it away in the catalogue file, and the user may access it whenever he so desires. As you

will be aware, there are really two basic ways of doing this. Either you can allocate a number to each disk, in which case a new user has to go through the disk library and write on his labels a discrete number, or each disk must have a different name. The reason is obvious of course. You cannot select a given disk unless it has something different, either in name or number, from its brethren. Mr. Robinson, the author of this program has elected to differentiate his disks by name. It is arguable that this is slightly more difficult than merely writing a number on the label but it is probably a more professional approach, even if it does incur a little more work. In any event, that is the way the program is written. One of the principal features of Discator is its speed of sort. It seems to go through file names at a very fast rate. One surmises that perhaps Mr. Robinson was particularly happy with this aspect of his program because after it has shown ''SORTED'', there is an exclamation mark, and we think it is well earned. It is a very good sort. The documentation is not luxurious but everything is in it that will be needed. Capacity is 256 disks, 1024 files. The program may be run on a single disk drive although it is fair to say that the user will get more benefit from two drives. As with almost all application programs running specifically under LDOS, this one takes advantage of the system's ability to retain dates and the date that the disk was created is displayed in the catalogue.

ACCEL 3 — A COMPLETE RE-WRITE OF ACCEL 2

This new addition to the Accel stable is being dealt with as a new program, rather than as an update, for Accel/Accel 2 has been completely re-written. The media available is still the same, that is to say, tape or disk, and Accel 3 is compatible with all of our normal machines with the exception of the TRS-80 Model II. Purchasers of the disk Accel 3, incidentally, should stipulate for which Model they require the software. The disk version is in a new self re-locating format and is self-loading, even on a one drive system. Accel 3 provides all of the advantages of Accel 2, in particular the execution speed up times. Accel 3 is strongly recommended for use in business software as it overcomes specific performance problems, such as poor keyboard response and keying over-run. Accel 3 avoids any specific dependencies on disk operating systems. Essentially it supports the Basic licensed by Microsoft to Tandy. ''Non-standard'' dialects may not be accepted, although some will be. The specific improvements of Accel 3 over Accel 2 are as follows:-

Compiled code is more compact.
Compilation is much faster — about the same time as it takes to load the program from disk.
Compiled programs can be saved on tape, using CSAVE, CLOAD? and CLOAD. (But TSAVE is needed to save compiled programs on tape).
Compiled programs can be saved on disk, using SAVE, LOAD and RUN.
Unstructured FOR-NEXT is supported, e.g. IF A = 1 THEN NEXT.
FOR-NEXT is optimised for SINGLE data-type (as well as Integer).
SINGLE and DOUBLE assignments are faster.
All array references are optimised:-
— Multi-dimensioned arrays as well as one-dimension.
— Variable-bound arrays, e.g. INPUT N: DIM A(N).
IN and OUT are optimised.
Unoptimised functions don't inhibit optimisation of the containing expression.
Accel 3 has no dependencies on disk operating system.

Present owners of Accel 2 should be aware that the /SAVE, /LOAD and /REPEAT keys are no longer supported. Single dimensional array references and integer FOR-NEXT loops are not as fast. USR calls are not optimised and support for the Stringy Floppy is no longer available.

MARQUEE — A SIGNBOARD PROGRAM

We have in the past stocked two programs which may loosely fall into the ''Signboard'' category. This new one is of such good quality that we are discontinuing the original Signboard. The other program of a similar nature of course is Blackboard. The Blackboard program simply takes the place of a blackboard, giving a static display, whereas Marquee reminds you of the advertisements merrily trilling around Piccadilly Circus. The principal feature of Marquee is the fantastically large buffer provided, thus making it possible to have messages of many thousands of characters apparently revolving around the screen. In fact it is so large that we imagine it would be possible to compose some type of attention-getting puzzle or instruction, such as ''wait here until you find this letter''. For you can have a static message on the screen at the same time as the revolving one. We would not have thought it would be difficult to come up with a very arresting message or puzzle with such a large buffer to play with. Another advantage is that you may elect to have a 24-hour digital clock of hours, minutes and seconds displayed at the bottom of the screen. Incidentally, both the characters for this and for the Marquee message are about an inch high. Personally, we have never been particularly impressed with clock programs unless the built in clock in the expansion interface is used, which in this case it is not. Hard as one tries over a period of time it is pretty well impossible to achieve accurate time-keeping, particularly on a variety of specimens of machine. All in all, then, this is a very good attention-getting signboard type program with the added features that (a) you can if you wish have a clock, and (b) the size of the buffer promotes a great deal of versatility.

SOLE — BOOT UP IN DOUBLE DENSITY WITH LDOS

For various complex reasons LDOS as it is supplied is unable to boot up in double density. To fill in a little background here, many double density systems have a double density disk but a single density first track. A prime example with which we are probably most familiar is the Model II TRSDOS. Thus the machine carries out its actual boot from single density boot but then switches over to double. As we have said before, this was not possible with LDOS for certain internal reasons. However, Sole enables exactly the above to be done. It is a utility in two parts and when the double density disk is treated by it you finish up with a double density disk with a single density first track. The beauty of Sole is that once done, it can be forgotten because normal mirror image backup will recreate duplicates of the disk with this feature included. In other words, you commit your Sole only once!

MINI UTILITY 2 — SPEED UP RELOADING

This is the second in our series of mini-utilities. The first one was for changing PRINT statements into LPRINT statements and therefore is features elsewhere in the catalogue. This one comes about by reason of the deathly slow speed of loading and saving data tapes into memory. Arrays loads snugly at the top of the memory and takes over the loading and saving of the arrays. The commands LOAD and SAVE are used and included in your Basic program. When they are called, the machine language mini-utility takes over and speeds up the LOAD or SAVE. Two dimension Arrays are acceptable. A handy little tool.

1982 EXHIBITIONS

Ever since we have been in business we have attended Microcomputer exhibitions. We have always restricted them to London and last year we tried the experience of going to just one and having a larger stand. Although as always the stand turned out to be smaller than we would have wished (one of the reasons was that it had a tremendous pillar in the middle of it!) it was a successful exhibition. Indeed, there were more through the gate in one day than during the entire length of other shows. This was, of course, the Personal Computer World Show. We, therefore, intend to pursue this course again and have booked Stand 334. The Exhibition will be for 4 days this year, spanning the 9th-12th September. Most interesting of all, it is going to be held at the Barbican Centre in the City of London. This is, as no doubt you will know, a completely new building and we are looking forward to this experience.

To summarize, therefore, we will be at the Barbican Centre from the 9th to the 12th September with what we sincerely hope will be a large enough stand in which, once again, to meet all our customers.

GUESSWORD AND WORM — TWO LIGHTPEN GAMES

This is a very funny business to be in. Some eighteen months ago, we introduced a low cost light pen and sat back and waited for people to submit hundreds of programs to be used with it. The pen sold, and sells well but we have had very few submissions as to software to run with it. Luckily Mr. Reavley of Nottingham has taken pity on us and we are therefore publishing these two programs which we must emphasise are only for the light pen. They are both contained on the same tape. Guessword is a children's game, although some adults may well find it of interest and gain enjoyment from it. Its purpose is to make up words from letters supplied by the program, which may not appear to be very difficult until one knows that you cannot see the letters. Each one is guarded by a light pen Pixel. You choose the pixel's entry point and hope to remember where the lines are. When ready you then make your choice and hopefully construct a word. The Worm game is essentially a board game. The purpose of the game is to conduct the light pen in such a way that your opponent, that is to say, the computer cannot move. The program has a look-ahead feature built in so that it is not just a dumb machine sitting there looking at you. All in all, an enjoyable game to play, and perhaps of more appeal than Guessword.

LBASIC — THE BIG BOOK

Although this is not a program, it is such an important publication that we are treating it as such. One of the big advantages of the Tandy TRSDOS when it was first published was that it was accompanied by a manual explaining the advantages of Microsoft Basic implemented by disk basic. There is no doubt that it is not part of a disk operating system author's responsibility to supply information on a language. Indeed Tandy have been the only ones to do it, up to now.
In fulfilment of their obligation to supply the very best in documentation, however, Logical Systems have now published a definitive book upon the LBASIC implementation supplied in LDOS. This is now available and we would recommend all LDOS owners to purchase one unless they are very familiar with LBASIC.

TELEPHONES

Over the last few months we have received some comments from customers that they are unable to get through on our present telephone lines. With the co-operation of Telecom, therefore, we have installed an entirely new system. This will provide us with a number of different lines and features. We will, therefore, be obliged if customers will note that our 223636 is a multi-line and callers are guaranteed to obtain a connection by using this number. 220391 will, of course, be retained and we must emphasize once again that this is the only line to which an answering machine is connected after hours.

UPDATES

PASCAL 5.0

This major update is scheduled for just after Easter and we are, therefore, including notification of it in this list. Pascal has undergone a series of changes of an evolutionary nature. Some time back in the catalogue we mentioned that the author, Mr. T.J. Bourne, had decided not to further upgrade the system. This brought a large number of complaints and we thought we should make it clear now that Mr. Bourne has retracted this decision and, as is shown by this new update, Pascal will continue to be improved. The next project after the 5.0 is to possibly introduce documentation in a tutorial style, accompanied by a course in Pascal on disk. Generally speaking, the 5.0 version includes full support for formatted real output, string and array comparisons, a trap facility for errors on disk files, identifiers of up to 99 characters, proper square and curly brackets if supported by the hardware (e.g. Model III), and finally, sets. It is intended that, hopefully, in the next list we will publish a new catalogue entry for Pascal, bringing all of the various updates into one section. It may be of assistance, however, for customers to know at this time that the language supported is based on the draft ISO standard, but is fairly similar to other microcomputer implementations such as UCSD. The most common question we are asked on the telephone about Pascal is whether or not it supports full floating point facilities, and we, therefore, take this opportunity of confirming that it does. We would like to emphasise that we are dictating this entry for the catalogue prior to seeing the 5.0 version. Mr. Bourne has told us that he will be including sets. If this particular item is of great importance to a prospective purchaser however, we suggest that he telephones for confirmation before placing his order. So as to further avoid any misunderstanding, we thought it might be advantageous to print a list of the standard and non-standard keywords supported. These are as follows:-

Standard keywords

AND	CONST	GOTO	REPEAT	ABS	EXP	OUTPUT	ROUND
DIV	DO	IF	(* SET)	ARCTAN	FALSE	PAGE	SIN
MOD	DOWNTO	(* IN)	THEN	BOOLEAN	INPUT	PRED	SQR
NOT	ELSE	LABEL	TO	CHAR	INTEGER	READ	SORT
OR	END	OF	TYPE	CHR	LN	READLN	SUCC
ARRAY	FOR	PACKED	UNTIL	COS	MAXINT	REAL	TRUE
BEGIN	FORWARD	PROCEDURE	VAR	EOF	ODD	RESET	TRUNC
CASE	FUNCTION	PROGRAM	WHILE	EOLN	ORD	REWRITE	WRITE
							WRITELN

Non-Standard keywords

ANDBITS	(* ERRORCODE,	LOW	ORBITS	RANDOM	TITLE	VARPTR
AT	ERRORTRAP)	MEMORY	PEEK	RND	TRACE	WORD
CALL	FAIL	MOVEDN	PLOT	SHLBITS	TRACEON	
CLOSE	HIGH	MOVEUP	POKE	SHRBITS	TROFF	
CMD	INKEY	NOTBITS	PRINT	STOP	TRON	

An asterisk and brackets indicates new commands for the 5.0.

SMART TERMINAL

This is available both for the Model I and Model III Tandy machines. We should take this opportunity to re-confirm that Smart Terminal is not, at the present time, compatible with the Genie machines, due to the difference in the RS-232 interfaces. The enhancements are as follows:-

1. Options for transmitting and receiving a program with verification are now included.
2. The sub-system menu has been greatly improved and now includes a status report on the memory statistics.
3. The screen contents are now saved whilst the sub-system is in effect and restored on return to the communication status.
4. A new "Save Program" option has been added for making backups containing various personal options.
5. The Read File and Read Cassette commands have an option for setting bit 7 of the incoming data to zero, thereby converting any file read to ASCII form.
6. The line print echo command is now buffered so the characters are not lost when printing in communication status.
7. The previous delay loop in the Model III version necessitated by the Model III ROM RS-232 software has now been removed, allowing transmission at the full speed of 1200.

AJEDIT

The actual program in this package has not been changed but the documentation has. We have never published a program and received so many comments on the documentation as has occurred with AJEDIT. Some customers have been quite explicit in their complaints that the documentation was too technical and other customers have thanked us for providing a manual that does not assume that they are beginners. In view of this serious split of opinion, we have now produced another manual written from the beginner's point of view. Two manuals are, therefore, now supplied with AJEDIT. Any existing owners of AJEDIT who would like to receive the new manual need only send in their request, together with the serial number of their copy of the program. There is no charge for this service.

ELECTRIC ACCOUNTANT

The 9 version of Electric Accountant is now released. Two enhancements have been added. Firstly, to permit more records, 250 per month, and secondly to allow the program to accept VAT amounts less than the current VAT, for instance, if discounted.

LDOS 5.1.2.

The enhancements to LDOS in the 5.1.2. update are different for the Model I and the Model III.

MODEL I

BACKUP has been changed to allow for the cancellation of the Query parameter during Backup. The Format utility has a new parameter which will insert a delay. This is to make up for certain deficiencies in some 80-track drives, it is not normally needed. KI/DVR has been significantly changed. Two new parameters have been added, one allows for the insertion of an initial delay between pressing a key and the first repeat. The second is a command to allow for changes in the key repeat rate. KSM/FLT also has a new parameter permitting the setting of any character to be used as an embedded enter key. LBASIC has a new parameter permitting the use of a default extension/BAS during certain operations, particularly the LOAD, RUN, MERGE and SAVE.

MODEL III

There are a large number of changes to the Model III, the most important of which we will mention. Patch files for Scripsit and Visicalc are now included on the Model III disk. Also a new file contains an enhanced Scripsit patch which makes use of the keyboard driver of LDOS. A utility for setting the default values of floppy drives is included which is normally only used when hard drives are also in the system. The Device command now shows whether VERFIFY is on. The Directory command has two new options. One is to sort the Directory into alphabetical order and the second is to just display files with the MOD flag. The SYSTEM library command has four new parameters. One enables or disables the date prompt when booting, and the other does the same for the time prompt. Due to the present proliferation of drives on the market, the most useful command is the ability to set the Bootstrap step rate used by Format. The final additional SYSTEM library command sets the default cylinder count used by Format. The Backup and Format utilities have been changed in the same way as the Model I. Various default values have also been changed in Format. LCOMM has been considerably enhanced. In particular the translation parameter has been changed to permit the translation of both a send character and a receive character. a further parameter added is the ability to prevent any nulls (that is to say 00) from being received. The Keyboard driver has been changed. First of all in the same way as for the Model I but in addition an extended cursor mode (ECM) has been added and all 128 ASCII characters are now available from the keyboard. Abbreviations have been added for existing parameters. The Ksm filter has a new parameter as with Model I, and the Minidos filter has a new key available for sending characters directly to the line printer. The printer filter also has one new parameter so that the anomaly of 66 lines per page with a start at 0 for the Model I versus 67 and a start line of 1 for the Model III has been allowed for. LBASIC now has the new parameter mentioned for the Model I and in addition RUN ''filespec'', V will now save any fielded variables used on the random files.

ISS 3.01

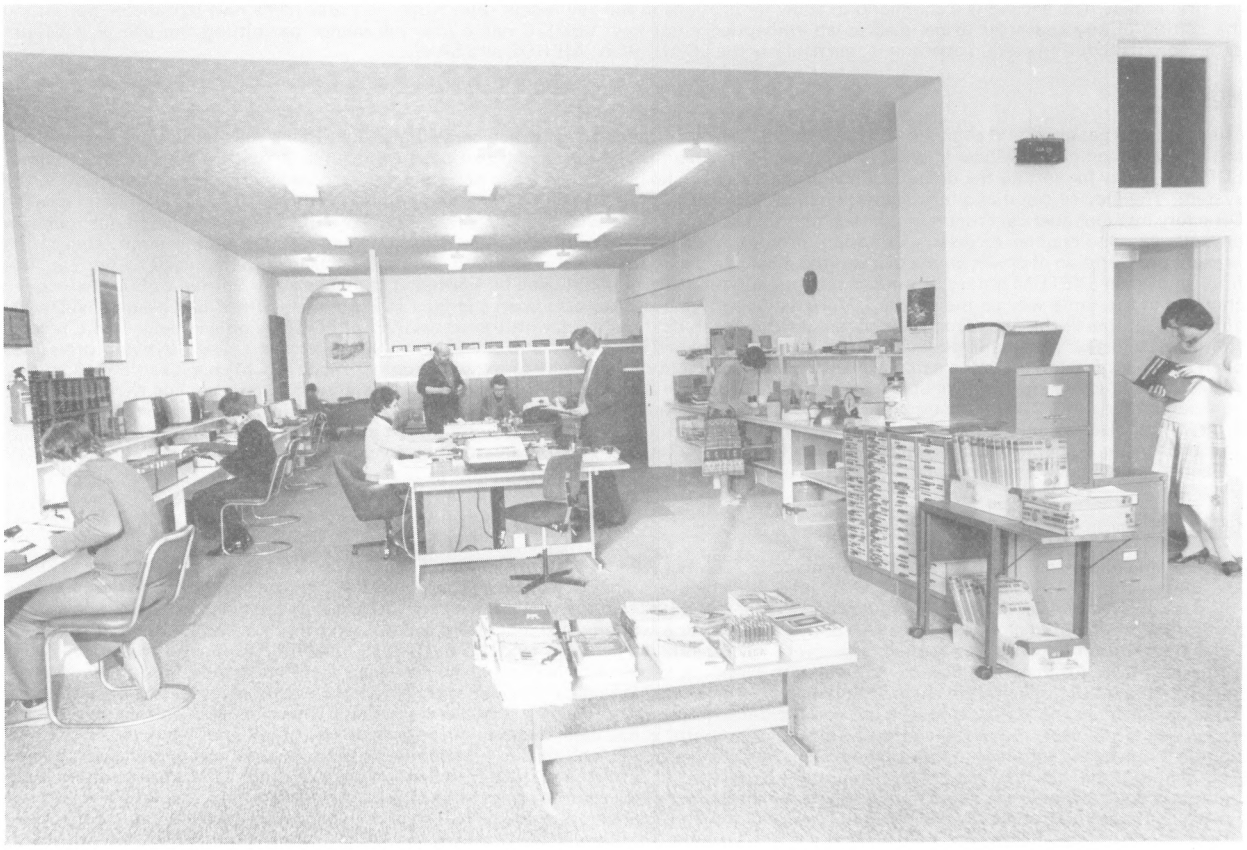
Considerable enhancements have again been made to ISS. They take two forms. First of all, previous incompatibilities between disk operating systems and, to a lesser extent, machines, have been eradicated.All of these comments, incidentally, refer to the disk version. There is now only one version for the Model I and Model III TRS-80 and the Genie machines. Instant Sort Search is not really the sort of application program which needs to be run under a customer's working disk operating system, and it is recommended that it be run under the DOS on which it is supplied. However, incompatibility between ISS and alien DOS's have now, for the most part, been eradicated. It is, for instance, now compatible with LDOS. A rather nice feature which has been incorporated by the author Gordon Hatton is that if ISS finds itself in an environment with which it is not familiar, it will not simply produce error messages or hang but will display a notice on the screen that it is not compatible with the DOS in which it presently resides. The most important improvement really goes to the heart of the ISS concept. Throughout its life, it has been a columnar orientated data base and hence the data to be input to it has been restricted to that which, minus certain overheads, will fit into a 64 character VDU line. By way of some very clever programming, this has now been changed, and the program will accept, and display, extended lines of up to 128 characters. The way that this is done is that at the beginning, for instance, of a sort/search routine, only the first set of columns will be displayed. However, a touch on the right arrow key will bring in the next column and the next, and so on. As columns appear from the right hand side of the screen, they of course, disappear on the left. If you will - column scrolling. The process which, as with anything in ISS is instantaneous, can be continued until the last column is reached or the process is reversed with the left arrow. The maximum number of columns remains at 10. The speed of ISS is not appreciably slowed down, and no extra file memory is used. The standard sort time with random data remains at 1 second for 500 records and about 2 seconds for 1000. As many users will wish to include more columns where sorting would not give any meaningful results, the option has been included to specify any column as not being a sort key. Entries in such columns are not subject to validity checks and any character or punctuation mark may be included in them. In addition to the above, and following on by reason of it, the printer output has been changed so that instead of the previous Screen Print, individual records are now displayed on the top two lines of the screen whilst they are being outputted to the printer as a single line. This, of course, of necessity means that a 132 character printer will have to be used if full lines are used. Of course there is no need why 80 column printers should not be used, so long as the lines do not extend beyond this length, or if the user does not require printed output.

HINTS AND TIPS — APRIL 1982

As you will be able to see from this literature, we have switched over to typesetting the catalogue. We are hoping that new copies of the typeset full catalogue will be available at the time that this list comes out, and hence the latter, as you can see, is in typeset form. This naturally has meant a great deal of work here at Molimerx. In fact, it would be hard to imagine the amount of very boring proof-reading that has had to go on, and I am sure that customers who get the full catalogue will find a lot of errors in it! All of this introduction is merely an excuse for the fact that I have not had time to get down to organising my usual jumbled notebook of Hints and Tips, so most of this column, this month anyway, will consist of more easily available chat on the industry.
As many of you will know, the big thing here at Molimerx just in recent weeks has been a visit by Mr. Bill Schroeder, the leading light behind LDOS. One of the prime purposes of this visit was to finalise arrangements over the issue, by Molimerx, of a stripped-down

LDOS. This is to be called Smal-LDOS. There will be two versions available, although it is not really any great secret that internally they are essentially the same. One will be sold by us to importers of the Genie, such as Lowe Electronics in U.K. and other importers throughout the world. The other will be sold by us direct and by our Dealers, to all users, so that existing Genie owners will not feel left out in the cold. Thus, the Genie now comes with its own disk operating system. We will be featuring the full description of it in our next list, but should any customers wish to get any pre-publication knowledge of it, they have only to give us a ring.
Naturally, we have been endeavouring to sap as much knowledge out of Mr. Schroeder as we can whilst he was here, and one of the tips which he gave me which may be of interest is the question of timing on disk drives. As you will know, on the soft sectored disk, each disk has a little hole in it. When this is passed by a light emitting and sensing device, a pulse is created. As there is only one hole per disk (emphasising that we are speaking of soft sector disks), the system has available one pulse every revolution of the disk. Without going any more deeply into the technicalities, a number of functions in the TRS-80 and, for that matter, in the Genie have been set so that they occur at divisible numbers of the normal disk revolution speed of 300. If one thinks about it, the 60 Hertz line in England both divide into the number 300. It is, therefore, possible, if a drive is perfectly set at 300, for the sensing circuit to do its thing precisely at the time the CPU interrupts. The result of this is that until the machine gets itself out of this everlasting loop, the pulse is never seen by the machine. The solution to this problem is quite easy. Merely adjust your drive to slightly over 300. I am not absolutely certain of the range allowed by the manufacturers but I think it is something like 2%. Anyway, certainly going to 302 or 303 or 304 would be perfectly acceptable. There are a number of ways of doing this, of course. The one I would suggest, for obvious reasons, is our System Diagnostic! An interesting tip from Ingleby Road, Ilford (our customer forgot to add his name) refers to the second cassette output on the Genie machine. The manual shows this port at FE but any OUT statement from Basic to this port seems to have no effect. Our customer suggests initiating the port by a PRINT -2 statement and then carrying out the OUT command to 255, that is to say, FF. The Reverend Wilson of South Shields wrote to us with a tip on the popular Epson 80 F/T printer. He was having trouble with the tab controls, and seemed unsuccessful in getting any help. Apparently, Page 44 of the Epson printer manual describes the use of the ESC D code. He tells us that the following command sequence gives the user the tab settings:-

Chrs(27);chrs(68);:out253,n1:out253,m2:.....out253,nn:out253,0
The n1 etc. are the numbers normally entered after ESC D.



As a mail order Company we have little personal contact with our customers in the flesh. We communicate with them on the telephone and in letters, but they seldom come and visit us in the outback of Bexhill. This is sad, but we tend to make up for it by going to exhibitions and you will see elsewhere in this list our intentions in this regard for 1982. Meanwhile, customers often ask us what sort of premises we have, so we got somebody in to photograph us at work. The above is the result. Unfortunately it can only show our general office area and the staff who were around at the time, but at least when you telephone us you will have some idea of to whom and to what you are speaking!

JULY LISTING

We will be at the Personal Computer World Show again this year — **Stand 334 September 9-12th.** We expect to receive our normal quota of complimentary tickets for regular customers.

BRITAIN'S No.1 MICROCOMPUTING SHOW
BARBICAN CENTRE, CITY OF LONDON 9-12 SEPTEMBER 1982

JUMBO — A TRUE FLYING SIMULATION

When we wrote the advertisement on this program for the magazines, we started it by saying that occasionally programs come along of such magnitude that they are hard to describe. In our normal ambiguous way, we then went on to describe it. Despite this paradox, without a doubt Jumbo is the best flying simulation that we have ever seen. Indeed, it is so good that we had to make an exclusion in our royalty agreement with the authors to the effect that they had specific permission to use the algorithms from the program for flight training. Such excellence, of course, does not necessarily mean that the program is good for the average microcomputer user. After all, it is not the object of such a user to learn to fly a Boeing 747. The program does have application for people who wish to do this, but in order to be a successful microcomputer program it must also have that certain something which gets the user tied to his keyboard into all hours of the night. Jumbo has this.

There have been one or two flying simulation programs before and we do not wish to degrade them in any way. In our experience, however, they have suffered by trying to be everything to all men. They have either concentrated on purely simulating the use of controls or they have used a large proportion of the program in trying to simulate (very good) graphics of the ground. It may be an anomaly, but it is also a fact that when you are flying an aircraft you do not really have too much time to be worrying about what the ground looks like, particularly if that aircraft is a 747. Such graphics, however good they are, therefore, waste memory. The graphics in Jumbo are first class, but they are not of the ground. They are of the instrument panel, and if you want to fly an aeroplane, whether big or small, it is the instrument panel that you had better concentrate on.

The program has been written by two gentlemen, one is a professional pilot and one is a very good programmer. The former has instilled into the program so much fantastically accurate simulation and "feel" of flying a large aircraft that it is almost uncanny. The latter has used a large number of programming techniques so that literally every last byte of the available memory is used. When you start Jumbo you are in the cockpit. From that moment on, you go through the entire spectrum of a trip. You have to start the engines, choose your route and course, take off, climb to altitude, cruise, start to let down, find the airport and eventually, hopefully, land. In other words, you get the whole flying experience. What is more, you can carry out your flight anywhere you want. Eight airports are available to you: London, Birmingham, Manchester, Prestwick, Edinburgh, Belfast, Shannon, and New York. We have already emphasised the authenticity of this software, and of course it takes some 7 or 8 hours to fly to or from New York. Accordingly, the author has allowed for a time abbreviation, or time out, feature. This permits one to go forward in minutes or hours, in seconds. During this time, an automatic pilot is assumed to be on and the distance to go, fuel consumption and time are continually updated as they would be in real life.

If you are beginning to feel that this is all a bit beyond you, take heart. We have prepared one of the most extensive manuals for this program that we have had available for any piece of software of even a slightly similar nature. In particular it occurred to us that not everybody knows how to fly a 747. Indeed, many do not know how to fly at all. In order to get true value from this program, it is necessary to know at least the rudimentary facts of flying. Accordingly, the documentation supplied has been split into two manuals. The first is a treatise on the theory of flight and how to control an aircraft. In order to maintain contact with customers who are not familiar with any sort of flying, this has been written by a private pilot and although it obviously refers to flying a 747 occasionally it principally uses as its guide the flying of a light aircraft. The second part of the manual, which contains instructions on running the program and flying a 747, has been written by the author of the program, that is, a professional 747 pilot. Accordingly, the documentation on its own is of considerable value, if you are in any way interested in flying. In addition to the foregoing, a chart is supplied, containing various items of data which you will need when flying Jumbo. It mainly consists of various parameters such as the take-off speeds for various weights of the aircraft, the flap retraction rates, climb and cruise speeds, and descent distances.

Whilst all of the foregoing is of course of the greatest importance, what really is impressive about the program is that it feels right. For even a private pilot with obviously limited experience or perhaps nil experience of flying large aircraft, a feel of flying is obviously apparent, even sitting behind the controls of a TRS-80 or a Genie! The controls are pretty well complete, even to dive and wheel brakes. The instruments supplied are as follows:

Artificial horizon	Attitude	Fuel
Aileron indicators	Compass	Elapsed time
Indicated airspeed	Turn indicator	Distance to landing
Power setting	Flap indicator	Rate of climb
Elevators		

In addition to all of the above, the programming half of the authorship consortium has somehow managed to squeeze into 16K very impressive maps of Scotland, Northern England, Southern England, Ireland, Eastern U.S.A. and the whole of the United Kingdom. As one progresses on a flight, so one's existing position is shown on the appropriate map. In addition, route information and in particular the bearing of the destination airport is shown. In other words, at all times one knows the compass direction to fly to arrive at the town chosen. To say the least, this makes life a bit easier. When one gets to the chosen airport an instrument landing system is provided. This, as pilots well know, is a radio beam transmitted along the runway at a specific angle so that if, when it is picked up say 10 or more miles out, the aircraft flies the beam exactly, he will finish up at the runway.

We keep on mentioning the realism of this program but it really is quite outstanding. For instance the flying simulation programs that we have previously seen all assume a specific stalling speed for the aircraft concerned. Although a given wing will stall at a given angle, the stalling speed of the aircraft is dependent on a large number of factors. These factors are re-enacted in Jumbo completely and in fact the present stalling speed is shown on the instrument panel at all times. Even a small thing like this has been polished up. As one approaches the stalling speed, this figure starts to flash to draw attention to it. When one gets to the actual stall, which one hopes one does not, then a very large indication comes up on the screen. This is not, of course, a crash. The Jumbo will stall, and one can recover from it, even though it is a highly undesirable manoeuvre to attempt.

There is a lot more that could be said about Jumbo, but perhaps the most important is that whether you have ever flown before or not, that is to say, flown in the pilot's seat before or not, you will enjoy Jumbo.

SEA WOLF — FOR UNDERWATER ARCADES!

It is a fair comment on the market today to say that one can be getting a little tired of space arcade games. We stock quite a few and there must be at least a hundred or so on the market. It is, therefore, with some relief that one turns to an arcade type game which takes place underwater, and it should be made clear from the start that it suffers nothing from that. It is in fact a very addictable piece of software. The idea is that you are in control of a submarine which can be moved in any direction, including diagonally with the arrow keys. Whilst you are happily proceeding upon your, no doubt, legal duties you meet ships, unfortunately enemy ones. They depth charge you, and you have to dodge the depth charges. There are two other main hazards to contend with. First of all there is always a liberal sprinkling of mines around to be avoided, and also of some importance is the bottom of the sea itself. This is very mountainous and continually changing. Contact with it will be catastrophic. It is a funny thing with arcade games. Everbody likes their own and in describing them it is very difficult to get across the "thrill level". Some of us in the office prefer this game to any of the space ones. Others remain loyal to Invaders and Asteroids. Whatever your taste, Sea Wolf is a very enjoyable arcade game. Scores are kept, of course, and there are five skill levels. For a change these are quite realistic. Sometimes one will get games where the highest level of skill is such that it is pretty well impossible to play and the least skillful is so slow that one goes to sleep. This is not so with Sea Wolf. The levels truly reflect the amount of skill which you have or have not gained from experience of the game. They affect the speed of the submarine and also the number of depth charges dropped by the search vessels. Furthermore, with each 10,000 points a bonus submarine is given, but on the other side of the coin, the level automatically goes one more difficult. If you get to 40,000 points then the number of mines automatically increases. Sound, of course, is included, but it would be fair to say that this is not a prime feature of the game. The controls are with the arrow keys. Sea Wolf is not simply a dodging game. The submarine itself has armament in the form of torpedoes which fire laterally and missiles which fire vertically. A nice touch is that the former are fired by pressing the left and right arrows at the same time, and the latter by pressing the up and down arrows simultaneously. As we have explained, the direction of the submarine is controlled with these same four arrows and so it means that one never has to take one's fingers off this set of keys. In the disk version the current best score is saved to disk so that it is available after a power-down.

GRAPHIT — GRAPHS AND VISICALC COMPATIBILITY

There are a number of programs which will portray graphs on a microcomputer. Indeed, we stock two of them already, namely Graph Plotter and Plotter. Both of these have additional facilities however, and it is fair to say that they are both fairly complex to use. Graphit, therefore, has been written with three prime requirements in mind. First of all, that it should not only be extremely easy to use, but also that there should be a Help command available at all times so that the user can immediately ascertain any commands that he has forgotten. The second requirement was that the files which are created should be compatible with Visicalc and vice-versa. Finally, the author was asked to provide a program in which the user can manipulate the graph in almost any way he can think of. In particular, we had in mind that the scale of the graph, in other words, its magnification or enlargement, should be almost infinite. We are happy to say that all of these requirements have been met. You can do with Graphit pretty well anything you could want to do with a graph. Two types of graphing, incidentally, are available — either zig-zag or step. This has been included because some data is far more easily displayed in one or other of these two methods.

To explain the Visicalc compatibility first. In Visicalc one can elect to store data in a number of different ways, one of which is a DIF (Data Interchange Form) file. Such files (containing data which is capable of being graphed) can be loaded into Graphit and a graph drawn. In the same way, if one elects to enter the data direct into Graphit, any file which Graphit makes can be loaded into Visicalc and the data manipulated in any way available in that program. There is, therefore, as you will see, complete interchange with the popular Visicalc program, which is manufactured by Visi Corp.

As we have said, Graphit is extremely versatile, particularly in its methods of display. Pages may be moved from left to right and up and down, either a page at a time or a column at a time. If one elects to enter data direct into Graphit then the user has editing facilities for deleting items and adding them. They may, of course, also be modified in any other way. In other words, one effectively has a screen editor available when in the data entry mode. The program is only disk compatible. It has no compatibility with tape, so the data files which are produced are saved to disk. The user has the facility for entering a title to the graph. Alternatively, Graphit itself will give it one, "Graphit Data". A hardcopy of the graph may be obtained. In other words, there is a command for sending the data to the line printer. Alternatively a screen printer, which is supplied in most DOS's nowadays, may be used. Also, of course, the data in tabular form may be sent out to a line printer. A particularly nice feature is the ability of Graphit to swap sides when it is displaying a graph. Let us, before we describe this, take an example. Assume that we have data made up of twelve calendar months and a sales figure against each. One can instruct Graphit to display the months either at the side or at the bottom of the graph. If, for instance, the calendar months are displayed along the bottom, then with one keystroke Graphit will change the axis so that the labels go up the side and the figures along the bottom. This can be quite an enlightening process, as a matter of fact. Also, whilst the display is being shown, the user can elect to change from zig-zag to flat or vice-versa. Flat, incidentally, is similar to a bar graph, but the lines at each graph point do not extend to the base line. In other words, a linear graph going up in, say, decades of 10 in flat display will look like a flight of steps. This method of display is usually preferred for the type of data of which we are speaking, namely month by month sales results. Other data, say, for instance, room temperature during a day, is more usually displayed in zig-zag form.

As we have said, probably the most important part of any graphing program is the scales of display available. In the first instance, Graphit will select its own automatically, but this may not be the one which the user wishes to have shown. Let us take another example. Assume that we are plotting sales figures (sorry to keep on using that example but it is an obvious one), over a 3½ year period, say from January 1979 to May 1982. This is 41 items. The maximum, incidentally, is one hundred. Let us assume further that we elect to have the labels, that is the month and year, along the bottom on the display. When the graph is first shown on the screen, the months from January 1979 to June 1979 will be displayed, in other words, six months. This may or may not be meaningful. If one wishes to examine, say, just the next six months, then all one has to do is to press the R key for Right and the months from July to December 1979 will be shown. Supposing that we needed January 1980 then we can press the right hand arrow key and the months from August 1979 to January 1980 will be displayed. Having looked at these months, we now decide that we would like to see a more extensive part of the graph. We have got August 1979 as our starting month, so let's enlarge to over a year. Pressing a key will produce a display from August 1979 to November 1980. Assuming that this is not enough, pressing the same key again will give us from August 1979 to May 1982. If you have followed the foregoing you will have seen that we have been ignoring the first few months of the graph. This, of course, need not be so, for merely pressing the L key will bring up the preceding page and add it to the existing one so that we now have a total graph for the period January 1979 to May 1982. This description has been somewhat long-winded, but we wanted to get across the point that literally any section of the graph can be magnified or made smaller at will. Had we decided, at the start, that we wanted the entire graph we need only have pressed the enlargement key twice and we would have got it.

So far as numerical data is concerned, the range is from minus 100,000 to plus 100,000. This has been selected because it is all that can be reasonably displayed. If higher figures are required, then the user should decide the scale of that himself, and perhaps contain a mention of it in the title, such as "amounts in millions", or whatever.

There is also a command to "correct" the axis by moving the origin to the first label and the value to zero. If, for instance, one has values both positive and negative up the side then if the values are symmetrical the graph will automatically select a scale which will put the zero half way up the screen. Correcting the graph in these circumstances would move the zero down to the left hand corner so that effectively only the positive values are shown. On almost all entries, a default value, which is displayed, has been allowed for. This takes the form of the default letter flashing at the cursor position. For instance, one of the questions you are asked is "Do you want to save the data to a file?" The letter N will be flashing. If you do not wish to save the data then simply hit the Enter key. If you do, you enter Y or YES. There are a number of convenience features like this throughout the program.

smal-LDOS — THE OFFSPRING OF LDOS

LDOS was under development in excess of a year, at a cost of between ¼ and ½ million dollars. It was, and is, an extremely professional disk operating system, providing the Tandy and Genie end user with, in our opinion, the finest DOS available. It was written after many of the other DOS's were either on the market or at least well known in the industry, and benefited therefrom. After we had been selling LDOS for some time we approached Logical Systems, the authors, and asked them if it would be possible to produce a stripped down version of LDOS suitable for the Genie machines, that is to say, the original Video Genie, the Genie I, Genie II and also the Model I and the Model III Tandy machines. Primarily the conception of smal-LDOS, however, was for the Genie machines because they are not provided with any disk operating system, whereas of course the Tandy ones have TRSDOS. We should say that it took a fair amount of persuasion, but eventually Logical agreed. The result, smal-LDOS, is an economically priced miniature of the original. Obviously, long, and I might say, late, hours were spent on making the decisions necessary as to inclusion or exclusion of LDOS features, but the result, we think, is a well-balanced DOS which has many of the features of the original, but in a number of respects excludes some of the complexities of LDOS. It is supplied with a comprehensive manual which not only covers the DOS but also the Disk Basic which also is included. smal-LDOS has obvious application for the Genie but it also has benefits for Tandy owners who have no experience of LDOS. Let us make it quite clear that if you have LDOS there is absolutely no purpose in buying smal-LDOS, but if you do not, then we have arranged the financial side of matters so that it is not prohibitive to buy smal-LDOS and then change to LDOS. In fact, it is true to say that smal-LDOS is the first disk operating system issued for these machines for which it is possible to upgrade to a full scale DOS without any large penalty. The reason for this is that every smal-LDOS comes with a coupon worth £15. This is redeemable at Molimerx against the purchase of LDOS. Hence (at the price as we go to press) if one takes advantage of this coupon, the effective price of smal-LDOS is only £23 + V.A.T. You may agree with us that this is a low price to pay for a disk operating system of the calibre of smal-LDOS.
Elsewhere in this catalogue you will find very full descriptions of the commands in LDOS. we need not, therefore, repeat them again for smal-LDOS. Perhaps, therefore, the reader will be kind enough to refer to pages 63 to 70 and 123 for explanations of the commands. The Library Commands in smal-LDOS are:

APPEND	DIR	MEMORY
ATTRIB	DO	RENAME
AUTO	FILTER	RUN
CLOCK	KILL	SET
COPY	LIB	SYSTEM
DATE	LIST	TIME
DEVICE	LOAD	VERIFY

The Utilities are:

BACKUP	HITAPE	RDUBL
CONV	PDUBL	REPAIR
FORMAT		

In addition to the above, one filter program is supplied, a printer filter, and one Driver, Keyboard Driver. Finally, smal-LDOS contains a full Disk Basic including a high speed sort but excluding two of the features in LDOS, namely cross-reference and re-number.
As we have said, all of the above commands will be explained under LDOS. Some of the commands in smal-LDOS will lack some of the full features of LDOS but in general they carry out the same functions. If any customer is unsure we can supply full leaflets on both, free on request, or we can confirm on the telephone. There is one apparent anomoly that we should mention, and that is the inclusion in smal-LDOS of the DO command without the inclusion of either the JCL compiler or a Build command. The purpose of DO is to carry out what may be an extremely extensive series of commands at power up time without any intervention by the operator. It takes a previously prepared file and executes everything in it as if the keystrokes had come from the keyboard. This file is usually compiled with JCL (Job Control Language). This is not included in smal-LDOS but DO will execute any ASCII file and as smal-LDOS is to some extent device independent like its parent LDOS, it is simple to construct such an ASCII file with the COPY command. In other words, one simply copies from the keyboard into a file, or, put even more simply one merely types from the keyboard into a disk file! One of the many joys of smal-LDOS! One other item of explanation. In the above list of utilities will be seen two utilities entitled PDUBL and RDUBL. The former is the regular LDOS utility to enable double density disks to be used on the Genie machines and the Model I Tandy. As will probably be generally known by the time this list is released, Tandy themselves will be releasing shortly their own doubler board. RDUBL is the driver for that board. smal-LDOS therefore supports double density with either hardware modification.

FASTBACK — MODEL II BACKUP FACILITY

It is a well-known complaint that the Backup facility in the Model II TRSDOS both 1.2 and 2.0 is rather slow. Accordingly, Racet have produced this program, which, unlike the TRSDOS one, copies by tracks and not individual files. It is, therefore, very much faster than normal and Fastback will in fact make an identical copy of a TRSDOS disk in 55 seconds, even if the disk is full. Although it copies by track, each sector is verified individually with full error checking. Disks formatted under either 1.2 or 2.0 (and these of course apply to the "A" variations as well), may be copied. The error checking is as extensive as is the checking in TRSDOS and one particular feature of importance is the fact that Fastback will copy a bad disk. One must make some sort of disclaimer on that remark. Obviously, if the Format is bad or some other catastrophic fault exists, even Fastback will not copy. The feature arises because whereas TRSDOS refers to the directory in order to carry out the Backup procedure, Fastback, as mentioned, does it on a track by track basis. Consequently, faults in the directory will not affect the Backup. Needless to say, a bad disk before Backup will also be a bad disk afterwards. One of the problems in carrying out surgery on bad disks is that if a copy cannot be made, one is working on the original. This is not very good for the surgeon's peace of mind. To be able to work on a Backup is a great relief. Fastback does not require a knowledge of the main password of the source disk. This facility is not put in to enable illegal copying but is inherent in the method used. In any event the destination disk will contain the same password and have exactly the same degree of protection.

555 — FOR ELECTRONIC BUFFS ONLY

It is little exaggeration to say that the most well known integrated circuit ever produced is one called 555. It is made by almost all manufacturers and is effectively the industry standard for timer circuits. It has a large multiplicity of uses, particularly in multivibrator circuits. The data sheet which is available from the manufacturers regarding the 555 usually includes a number of graphs for the rough selection of component values. These external components decide the frequency at which the timer, that is to say, the 555 will oscillate. Although in no way impractical, it is a fair comment to say that the results of using these graphs is not always as precise as one would wish. Accordingly, this program has been written to enable an electronics constructor to find the answers to a 555 problem in a quick and accurate manner.
The user must first enter the frequency required for an astable multivibrator together with the pulse width desired. The duty cycle or low pulse width can be entered, depending upon whichever is known. Forty-four preferred values of capacitors are available in the range of .001 to 100 microfarads. The lowest value capacitor that will function in the circuit is shown first, and if any other higher values are suitable they will be displayed as an alternative values function. Two types of astable circuits are used, the conventional one for a duty cycle of approximately 50 to 100% and an extended duty cycle of near 0% to 100%. In addition to finding component values in these two astable circuits, the program may also be used to display the resulting parameters from the use of known component values. In the monostable mode a time period may be entered and component values found. In a similar manner to the description for the astable circuit above known values for a monostable circuit may be entered, to find the component values.
The graphics of the program are good. The circuit is shown nice and neatly and a particularly nice touch is an animated display of the pulse itself which is related to frequency by its speed and to its duty cycle in five, 20% steps. The accuracy of 555 is good, but it should be borne in mind that the chip itself may only be accurate to within 2% in astable. Furthermore, depending on the external components in use they will have a tolerance all of which will instil some error. As users well know, in particular electrolytic capacitors sometimes have a very large tolerance range.

CRUSADERS — SARACENS AND CRUSADERS

It is a little difficult to decide whether or not to call this a war game. It is in all respects the type of game that is so normally described. On the other hand, we are not at all sure that it is accurate to call a series of conflicts between the Crusaders and Saracens, a war. Anyway, the scenario is that you are the King of Jerusalem and have to rule your Kingdom from 1169 to 1177. Your ultimate aim is to prevent any incursions by the invading Saracens. You have a total of forty-eight fortresses, all interconnected by caravan routes. The program will pick these off one by one, unless you can defeat the Saracen army in the field, by gathering together an army for yourself from the various garrisons.
Each year consists of six (bi-monthly) moves. At the end of each year (at play rating 6), you will find a new Saracen army moves into the Kingdom from enemy territory. All Saracen armies that stay in the field for a year are reduced by desertions.
The program itself has an artificial intelligence, in as much as the Saracens attempt to seige and take castles and fortresses that they have not previously moved to. In this way a Saracen army that has been seiging for a few years may be reinforced by a new army, which may be sufficient troops to affect the taking of the fortress.
However, your troubles do not stop there! You have to provide food for garrisons and your assembling army. If you find a garrison is under seige, the only way to give them food is to send a caravan, which costs money!

The historical background is:
In 1160 Nur-ad-Din captured Reynald of Antioch and four years later he defeated and captured Bohemond III of Antioch at Artah. This left Jerusalem the supreme Christian Kingdom in Syria.
In 1162, Baldwin III of Jerusalem died and was succeeded by his brother, Amalric. He was defeated at Ashmun by the Syrians in 1167, but in August of the same year, Saladin, commanding the Syrian garrison of Alexandria, surrendered to Amalric and his Egyptian allies.
By 1168 Amalric had camped outside Cairo, but withdrew when the Caliph received forces in response to an appeal to Nur-ad-Din. During Amalric's absence Shirkuh, Nur-ad-Din's lieutenant, seized control of Egypt and became Al-Adid's vizir. On 23rd March 1169, Shirkuh died and was succeeded by his nephew, Saladin.
The program is menu-orientated and a map is supplied for both the Northern area and the Southern. The graphics are good, and both Crusader lines and Saracen lines are also displayed, again with an appropriate map. The caravans, of course, are used to transport food from town to town and when this option in the menu is selected then the 5 available caravans are displayed on the screen. You then have four options, to attach or detach food or horses, and to raise or move caravans.
The program is quite involved as many war games are, and again in a similar manner to such programs, the year is split up into moves, in this case, six. Seiges are rather fun. The beseiged can hold out whilst their defence points exceed the number of beseigers. If the Saracens exceed the defence points, then the defences will be weakened by as much as the difference between the Saracens and the defence points. When and if your defence points drop below zero then the garrison falls to the Saracens. In summary, quite a complex, but rather enjoyable strategy game.

PARAFORM — DISPLAY THOSE PARAMETERS

This is a program for disk owners and is compatible with LDOS, TRSDOS and NEWDOS+. Disk operating systems have evolved over the last two years or so, and the number of parameters used by individual commands has risen almost pro-rata to the complexity of the functions carried out by the commands themselves. It is often difficult, therefore, to remember all of the parameters available with specific commands. This utility is designed to be resident in the system at all times and to display the parameters available for any given command and to provide an easy method of entering command parameters. The program takes about 700 bytes of memory and is loaded of course from DOS. High Memory is adjusted to protect Paraform, and so long as the utility is to be left in memory during the particular power-up, its loading can be Configured in LDOS so that it is installed automatically. It could also be made the subject of an AUTO command in TRSDOS and NEWDOS+ and presumably could be loaded under the little routine in the Hints and Tips this month. Paraform may be removed at any time with a simple command and the memory used by Paraform will then be released, provided that Paraform was the last program loaded into High Memory. This, therefore, presupposes that Paraform will not be loaded from Basic, which in any event would probably be rather poor procedure.
After Paraform has been loaded it is used simply by typing the appropriate command, that is to say, the command about which you wish to know the parameters, followed by a question mark. The parameters available with that command will then be displayed ten at a time on the screen, **together with** the value held by the program as the default entry. The operator may then enter a parameter such as Yes, No, On or Off, and so on. This will then be exchanged for the default values and used by the program.

LED — LDOS GENERAL PURPOSE EDITOR

This is the official LDOS Text Editor designed for writing and maintaining almost any type of text. It will handle both line number and un-numbered text files in a word processor like manner. Indeed, it could be used as a word processor, although perhaps not one with very enhanced features. It is perfect for all types of pure Source files, including Basic. It may also be used on PATCH and JCL files. It is priced low as an add-on feature to LDOS.
It is made particularly versatile because of the number of parameters that may be added when designating the file that you are going to edit. First of all, of course, is the ordinary ASCII file. If the file is of this nature then this is added as a parameter. The second parameter will enable you to save the terminator of whatever file you are loading. A particular application of this parameter is to create a Scripsit compatible ASCII file. The next parameter available is the ability to extend tabs when loading a file with embedded tabs. If the file to be read is a word processor text file ending with a Hex 00 byte which is to be retained, then this must be specified. Finally, a very useful Translate feature is available as a parameter, whereby one byte is translated or changed into another byte as the file is loaded or saved.
It is not really necessary to go through all of the commands of LED. Apart from the above, it is a fairly straightforward screen-orientated text editor. The arrow keys are used for positioning the cursor. KI/DVR, incidentally, must be loaded before LED and, therefore, the facilities of that Driver are available in this program. There are tab controls and one is able to get to the beginning and end of line positions with single keystrokes; the same remark applies to the top or bottom of text. One rather nice convenience feature is that the Menu is available at all times in a bottom "window" of the screen. The editing features include insertion and deletion. Blocks may be marked for deletion and there is a Search command and a Change command connected with it. Rather unusual for a text editor is the feature which allows characters to be entered in Hexadecimal form. Scrolling both upwards and downwards on the screen is by page and an ALL command is available for use with the Find, Change and Tab commands to select global operations. After you have operated on the file, it may be Saved under a different name, thus it will not overwrite the original unless required. LED is compatible with smal-LDOS.

Hints and Tips — July 1982

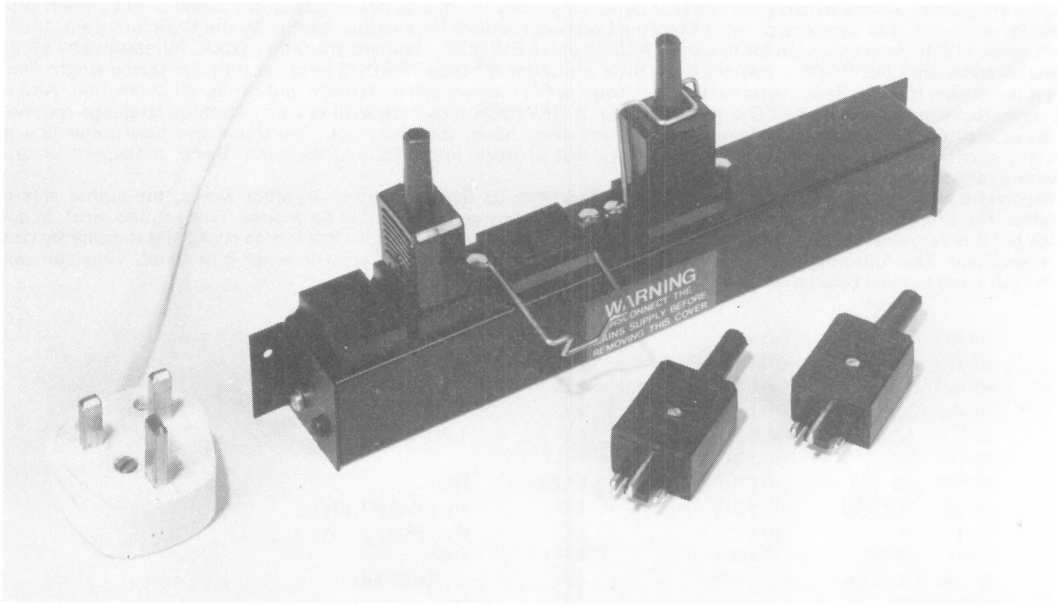
This month, much to the annoyance of tape owners, no doubt, I am going to devote the whole column to a technique which is of use to disk owners. As a matter of fact, as I come to dictate this column, it occurs to me that the same technique probably would have application for tape users as well, although somewhat restricted, so before I get letters on the subject, I have not checked it out on tape!
The disk owner frequently wishes to carry out commands automatically in DOS before entering into Basic to run a main program. The classic example, of course, is to Load one or more Machine Code subroutines for eventual calling by the Basic program. LDOS, and to a lesser extent, smal-LDOS, have provision for this but TRSDOS and NEWDOS+ owners are rather stuck, for essentially all they have to use is the AUTO command. NEWDOS+ owners are a little bit better off than TRSDOS because they do have a single line entry into Basic. Thus it is possible to enter Basic, reserve memory, reserve file buffers, call a program and run it, all in one line. And this line, of course, can be made the subject of an AUTO command. Also, if NEWDOS+ owners wish to call a machine language routine, they may be able to do so with the CMD command from Basic. On the other hand, they may not. The Command Interpreter is a bit temperamental. In any event, they must go directly into Basic and out of Basic into DOS and back into Basic. Inelegant, to say the least. TRSDOS owners cannot even do this.
There is a technique whereby the Keyboard Driver is diverted from its normal pointer. In other words, the author sets up his own keyboard buffer. He, therefore, has control of it and can place into it any commands that he wishes. This routine must, of course, be in machine code but it is very short and simple and should not give anybody any trouble. In fact it is so short that it probably does not even need to be assembled. The following listing is of an assembled file, in case people want to enter it by hand. They can use the hexadecimal in the left hand but one column.

```
BFA0            00100           ORG     0BFA0H  ;OR WHEREVER
BFA0 21ADBF     00105 START     LD      HL,KEYBD
BFA3 221640     00110           LD      (4016H),HL
BFA6 21C9BF     00120           LD      HL,CMDS
BFA9 22C7BF     00130           LD      (BUFFER),HL
BFAC C9         00140           RET
BFAD E5         00150 KEYBD     PUSH    HL
BFAE 2AC7BF     00160           LD      HL,(BUFFER)
BFB1 7E         00170           LD      A,(HL)
BFB2 FE0A       00180           CP      0AH
BFB4 CABDBF     00190           JP      Z,REGKBD
BFB7 23         00200           INC     HL
BFB8 22C7BF     00210           LD      (BUFFER),HL
BFBB E1         00220           POP     HL
BFBC C9         00230           RET
BFBD 21E303     00240 REGKBD    LD      HL,03E3H
BFC0 221640     00250           LD      (4016H),HL
BFC3 3E0D       00260           LD      A,0DH
BFC5 E1         00270           POP     HL
BFC6 C9         00275           RET
BFC7 00         00280 BUFFER    NOP
BFC8 00         00290           NOP
BFC9 4C         00300 CMDS      DEFM    'LOAD MON4/CMD'
BFD6 0D         00310           DEC     C
BFD7 42         00320           DEFM    'BASIC'
BFDC 0D         00330           DEC     C
BFDD 35         00340           DEFM    '5'     ;FILES RESERVATION
BFDE 0D         00350           DEC     C
BFDF 34         00360           DEFM    '45678' ;MEMORY RESERVATION
BFE4 0D         00370           DEC     C
BFE5 52         00380           DEFM    'RUN "TEST/BAS"
BFF3 0D         00390           DEC     C
BFF4 0A         00400           LD      A,(BC)  ;COMMANDS TERMINATOR
BFA0            00410           END     START

BUFFER          BFC7 CMDS               BFC9 KEYBD              BFAD
REGKBD          BFBD START              BFA0
00000 Total errors
```

The address, of course, may be changed for wherever you wish to place the little program. As an example, I have put in the program the command to Load MON4/CMD, take a call into Basic, enter the answer to the files query and then the memory reservation query, and finally run the program. This example, therefore, is written for TRSDOS. A NEWDOS+ version would contain the memory and file reservation in the Basic call. This is a simple application but so far as I know the number of commands as to loading files could stretch almost into infinity. We are certainly running one where three files are loaded before the call is taken into Basic. DOS commands which require an entry from the keyboard must have those entries pre-determined — as in the answer to the Memory Size? above — or the regular keyboard routine would have to be re-initialised.
I do not think the listing requires much explanation. As you will see, apart from the actual commands, which are merely message definitions, there are only four sections. The program enters and starts from the beginning and the first four commands are to divert the normal Driver address contained in the keyboard DCB from the normal 03E3 to the one which we have chosen. In the normal way it is loaded into HL which is then loaded into the address concerned, 4016. The next two commands set up a pointer for the buffer into which, later, the commands address will be placed. That is all that is executed at first fire up and as you will see a Return is taken. The second section of code commences with the label KEYBD and constitutes our Keyboard Driver. It reads off the commands until it finds the end of message flag. We have used a carriage return OA. When this is found, a jump is taken to the third section, label REGKBD, and all this does is to re-set pointers as they were before we started to monkey about with them.
So, as you can see, it is very simple and will work in most applications. You will get an extraneous WHAT? query if you do not go into Basic, as the Command Interpreter finds something in its buffer that it does not understand. I am sure this could be got rid of quite easily.

INTERFERENCE SUPPRESSED DISTRIBUTION UNIT



A NEW IDEA IN INTERFERENCE SUPPRESSION

A Mains Suppressor with the added bonus of a neat, tidy and safe way of connecting your microcomputer and its peripherals to the mains line!

The QED. computer distribution unit provides four miniature mains socket outlets set in an in-line format, for the most efficient use of space. Inside the strip outlet is contained a Mains Suppressor for comprehensive protection against both Continuous and Discontinuous mains borne interference.

The interference suppressed distribution unit contains a full specification interference filter with a frequency range of 150KHz to 100MHz and a discharge time of less than one second.

Although mains interference is an abstract phenomena and therefore difficult to test, we fitted it to a Tandy TRS-80 set up consisting of three drives, a Tandy VI printer, V.D.U., Expansion Interface and Keyboard. This equipment is located in an area in which interference is widespread. Frequent re-bootings were experienced, particularly associated with the switching on or off of domestic appliances and mains surges. After the suppressor was fitted, the re-boots disappeared.

The unit complies with BS613 for mains suppression. It is supplied with a two metre lead fitted with a 13 amp plug. Four miniature plugs are also supplied and as you will see from the photograph, two of the sockets are fitted with retaining clips.

SPECIFICATION

Size:	10″ × 1 3/8″ × 1 3/8″ (255 × 35 × 35mm)
Length of Cable:	Two metres fitted with 13 amp plug
Max. Power:	1500 watts
Max. Current:	6 amps
Max. Voltage:	250v AC
Insertion Loss:	To BS613
Frequency Range:	150KHz to 100MHz
Discharge Time:	Less than one second
Fusing:	5 amps
Mains Socket:	A total of four miniature sockets with two sockets fitted with plug retainers for computer and floppy disk

SEPTEMBER LISTING

CIRCUS — THE SIXTH MYSTERIOUS ADVENTURE

Your car coughs and splutters briefly then grinds to a silent halt. You curse inwardly as you stare vainly at the petrol gauge. You have run out of petrol miles from anywhere, no petrol stations for miles around and it will soon be dark. Grimly, you lock up your car and take the petrol can from the boot. After a brief survey of the surrounding terrain you set forth in search of help, hoping to come across a remote farmhouse or village. Three miles further down the road your hopes of rescue are beginning to dwindle when you suddenly hear the faint sound of distant music coming from somewhere ahead. You step up your pace and head toward the sound, as you reach the brow of a shallow hill your eyes are met by an inexplicable sight . . .

About a mile away nestling in a small grassy valley you see a huge Circus tent. Wafting up the hill toward you come all the familiar sounds of Circus activity, bells clanging, children's laughter, a brass band playing, lions roaring . . .

Eagerly you set off down the hill toward the strange spectacle, as you approach the huge tent you puzzle about why there should be a Circus held in the middle of nowhere and begin to look around for someone to ask about obtaining petrol. You reach the outer fences of the Circus grounds and open the gate . . . . . Suddenly all sound is cut off as if by the blade of some gigantic knife. In a split second this whole scene is transformed from one of bustling activity to the silence of a graveyard. Bewildered by this unearthly transformation you tread fearfully toward the entrance of the now deserted Tent . . . . . Darkness is falling and this is going to be a long, long night . . . . . .

FEASIBILITY EXPERIMENT — THE SEVENTH MYSTERIOUS ADVENTURE

Far beyond the outermost Galaxy of our universe, beyond the wildest imaginings of mortal man lies a newly born World. A World manufactured artificially from the raw materials of the universe. Painstakingly created by the pure thought processes of beings immeasurably superior in intellect to ourselves. Beings who possess no physical form, but exist only as clouds of pure mental energy, capable of projecting their will over infinite distances.

At the Geometrical centre of this artificial world there exists an immense cavern, created by these beings as a place of worship. The one solitary object of worship in this shrine, a statue carved in the image of mortal man. At the base of this statue are inscribed the three words: ALEXANDER THE GREAT.

Millions of our years after these beings had discarded their physical forms as an intolerable burden, their perceptions were clouded by a catastrophic vision of their own impotence. After eons of roaming the universe, fascinated by their own ability to create or destroy whole galaxies at the merest whim, they slowly became aware of their disastrous handicap . . . . their absolute inability to reproduce the one thing that would ensure their eternal existence . . . Themselves.

As their power began to wane, their energy slowly dissipating over the vastness of space, they began the desperate search for a sustaining life force. At length their thoughts drifted to our world and here they beheld the spectacle of a great Warrior. They were invigorated by this spectacle, drawing power from the life force of this charismatic figure. Hence, they retired to a region beyond all reach and created for themselves a place of worship, believing that such worship could guarantee the survival of their race.

Eventually they realised that this was not enough, a mere image of a hero could not sustain them; they would have to find a real, living hero and draw their essential life force from this. To this end they built on this artificial world a scenario such as they could use to test the heroism of their subjects, for their hero would have to be brave indeed to satisfy their hunger for life force. Their thoughts turn again now to our planet .....

As you sleep this night, your dreams are disturbed by a ghostly voice; at first the voice seems to ask you gently to follow it; at your vague refusal it becomes more insistent, eventually growing into a howling demand for your presence. As your last remnant of resistance is shattered, you jerk awake to find yourself on the floor inside what seems to be an old mansion. As you raise yourself up and try to make sense of your surroundings, you have no way of knowing that you are now the subject of a .... FEASIBILITY EXPERIMENT.

PENETRATOR — NEW FROM MELBOURNE HOUSE

The games publishers Melbourne House, who sell Penetrator and Strike Force in Australia and the United States, and Molimerx, have been able to come to an agreement, whereby we will be representing Melbourne House in the United Kingdom exclusively.

Penetrator has already gained considerable fame in the United States as a first class arcade game. The scenario is that you take the part of the sole survivor of a fighter squadron whose mission is to invade enemy defence forces and destroy their illegal neutron bomb cache. The mission is highly dangerous and the enemy have installed extremely efficient defences around their neutron bomb stores. The defences are made up of four enemy defence rings, each with its own special dangers. You must penetrate each of these rings to get to the illegal neutron bomb store. Thereafter you must return out through the rings. Scoring is 10 points for ground missiles, 100 for radar bases, 200 for defending paratroopers and 1000 for the first neutron bomb store. The neutron bomb score points are doubled for each store knocked out. The game supports two players if required. Your fighter ship is controlled with the four arrow keys in the normal way. It is possible to brake the ship, but only for a short period. You have a forward missile launcher which is activated by repeatedly pressing the right arrow key. You may also drop bombs on the enemy landscape, hopefully hitting missiles or radar bases. If you are not careful you will encounter the Red Alert. When and if this is achieved you must assume that the enemy has tracked your flight and evasion will now be very difficult. As we have said, there are four stages of defence; the first is the ruggedness of the mountain-side. Obviously if you collide with this you will fail. The second stage is underground, in caverns so that your fighter plane does have room to get down them. There are no new dangers; missile bases and radar stations are still with you, but your moveability is cut down very considerably. The other stage is said to be the most difficult and is a concrete underground area with missiles strategically placed in concrete silos. Stage four is a bit of a mystery because very few fighters have survived it!

One of the big points of Penetrator is that the game can be customised, in other words you are able to change the shape of the landscape and number and positions of the missiles and radar bases. This means that you can produce a new game whenever you wish. Penetrator is a good arcade game. We only have two criticisms of it; one very slight, namely that whenever a game is over one goes through the initialisation period again for the new game. This takes the form of drawing the name of Penetrator out on the screen. This is very nicely done, but does take 30 seconds or so. As we have said, a very small point. The other criticism is also a slight one. The program is very busy most of the time coping with the extremely good graphics. Play is, therefore, very slightly slow. Both of these criticisms are more than made up for by the many good points about the game, in particular the customisation and the ability of two players to take part.

STRIKE FORCE — SECOND PROGRAM FROM MELBOURNE HOUSE

Penetrator, described above, has received a great deal of publicity from Melbourne House in the United States. We assume that Strike Force will receive the same treatment because it is a first class arcade game. We would guess that Strike Force post-dates Penetrator because it contains a large number of the programming techniques with which we are all now getting so familiar. Melbourne House, on the packaging, say that Strike Force is the ultimate challenge in arcade games and this may well be so. Indeed, perhaps we could do little better than to re-print their sales comments as follows:

"Strike Force is the ultimate challenge in arcade action — bent on destroying your concepts about game software!

You'll need iron resolve and nerves of steel to go forth and defend a world of vulnerable cities under relentless alien attack. You are

the mighty warrior — saviour of these cities! Armed with rapid-fire missiles, long range radar and incendiary star-shells, you'll need breathless speed to combat all the bombers, escorts, fighters and missiles. Your force field may give you temporary relief, but watch out!

Skill, cunning, lightning fast response and a keen sense of strategy are not just important — they're imperative to your life and the lives of millions of City dwellers! Strike Force, stretching your skills and imagination beyond this planet, is undoubtedly the fastest and most complex game you will ever see!''

The quality of Strike Force starts right from the beginning. It is hard to describe the graphics, but the words 'Strike Force' appear on the screen as a sort of explosion, which is very effective. The four arrow keys are used in the normal way to control the ship. A very nice feature is that when you reverse direction the ship itself turns and the landscape, of course, starts going back the other way. This gives a very realistic effect and when combined with the fast speed of the game and excellent graphics one can see that the author's claims are not at all preposterous. Like our game 'Defend', one has a ''preview'' of what is coming up and hence can make some sort of plans to avoid the various problems with which you will be faced. You have the use of a force field for protection and you can set this to an energy level of 1-7. Like Defend, the game may be played by two players. Forward firing is supported by way of the space bar. Like Penetrator, the ultimate aim is to get to a neutron bomb, but along the way you will have to get yourself some incendiary star-shells. These can be collected either by landing on them and picking them up or by flying through them. Whichever way, you are going to need one when you get to the neutron bomb.

Penetrator and Strike Force are to some extent similar. They both, incidentally, have sound. As we have occasionally mentioned, quite frequently the likes and dislikes of arcade games are very much subjective, a matter of taste. We feel that Strike Force has a slight edge on Penetrator, but we could quite well be wrong. Disk versions are available for both games.

LABELMAKER — CASSETTE LABELS AS WELL

This is a purely utilitarian program for use with Epson MX80 printers with or without the Graftrax + modification. It enables the design and manufacture of labels for any application from jam jars to cassette tapes. Two standard label sizes are supported, 3½" × 15/16" and the normal cassette. The following are a couple of examples:

It is not really until one gets this program that one realises how useful labels are. There are literally thousands of applications, many of them far removed from the computer industry. In the manual that comes with the program are some Labelmaker user applications. One of them we particularly like is for home-made wine!

As we have said, Labelmaker enables one to design any label. There are 16 label formats provided for the standard 3½" label. Each of these formats may be modified into many different configurations. There are four print types used and thus the permutations of contents and type is almost infinite. The most distinctive type style is the jumbo, which is almost 3/8" high. The program is supplied on disk and is written in Basic so it should be compatible with any DOS. It certainly is with TRSDOS, NEWDOS + and LDOS. The label format which you design may be stored on disk so that you can come back to them again in the future, and an index is maintained of them. The program is Menu orientated. The Menu provides for accessing the Label file, accessing the Label file index, calling up the print routines and, finally, adding a new label. The latter, of course, is the most important. Constructing a label is extremely easy. First of all one chooses which of the 16 formats is required and then you simply type in the copy that you want to appear on the label. As you do it a facsimile of the label is shown on the screen, so it really could not be easier. Anything you do not like you change and thus print out a sample label. If all is well you then print out as many as you want. A very easy to use program with a simple end product, but as we said earlier it is not until one has the ability to make labels that one understands how useful they can be. Lower case, incidentally, is not mandatory, but it certainly improves the look of the label. We are supplying the program with a quantity of ordinary and cassette labels, but we will not be selling labels on their own. We have arranged with the Paper Shack, 8 Tate Road, Sutton, Surrey, to maintain a stock of labels used with this program and they will be happy to serve your needs.

A l'attention de notre clientèle Française

Nous désirons, Messieurs, attirer votre attention au règlement suivant: une carte de crédit French Visa n'est pas valable à l'étranger si on s'en sert pour une commande par correspondance.

La France et le Sud Afrique sont les seuls pays qui exigent cette restriction at nous devons néanmoins observer ce règlement.

Prière à ceux en possession d'une carte de crédit Visa de notre que nous regrettons ne pouvoir accepter cette modalité de paiement.

A notre avis, aucune autre carte de crédit n'est soumis à cette restriction et nous serons très heureux d'accepter les cartes de crèdit Master Charge ou American Express comme paiement.

COLORZAP – FOR THE TANDY COLOUR COMPUTER

This is a new utility for the Tandy Colour Computer and, as its name implies, it is a program with which to zap disks. As such, incidentally, we are inclined to think that it is unique. There are seven main commands as follows:

DISPLAY DISK SECTORS
VERIFY DISK SECTORS
COPY DISK SECTORS
OBTAIN DIRECTORY
DISPLAY BY FILE SPECIFICATION
ZERO DISK SECTORS
CONVERT GRANULE NUMBERS

We will briefly go through these commands. The Display Disk Sectors does just that. The display is a type of horizontally split screen. The actual data is shown in the bottom half, whereas the top contains the sector identity and byte numbers. You can, of course, move to any character in the sector in order to modify it and scan back and forward through the sectors. The Display by File Specification is similar to the foregoing and the same commands are available. Verification, Zeroing and Copying are all self-explanatory. The Convert Granule Number command requires some explanation. The directory of the colour computer's disk indicates the location of files by their starting granule. If you are attempting to examine a file, however, you need to know the track and sector numbers of the start of the file. To do this you must Convert the granule number into track and sector numbers. This command performs the arithmetic for you. The final option is to View the Directory, and this is straight forward.

A number of commands are provided whilst in the display modes. All of them are quite normal and enable the user to manipulate the display and the contents of the disk in one way or another.

The manual is quite short, only 24 pages. It does contain a great deal of very useful information, particularly on the disk format of the colour computer and there is included a chapter on how to recover killed or clobbered files. All in all, this is an indispensable utility for the colour computer owner with disk drives. We have not described it as fully as we could have done because there are many zapping programs available for the Model I and Model III – see for instance Prozap. Essentially Colorzap is a Zap and reference can be made to descriptions of other Zaps for details. The importance of Colorzap is that it is for the Colour Computer.

FROG II – NOT TO BE CONFUSED WITH FROG I !

The somewhat facetious title must be explained. We already stock a program called Frog described on page 52 of the catalogue. This is an entirely different game and, therefore, has had to be differentiated as shown because we cannot think of another name for it. Frog II is an arcade type game whereby the user, as a frog, endeavours to cross a street, then a river and finally the frog has to find its way into its own hole. It is all very good fun. As always with arcade games, many things are put in the frog's way. As it crosses the street there are cars going in all directions in three lanes. Funnily enough this is not the greatest obstruction. It is when the frog comes to the river that the problems really start, for he must find transportation across. This can take one of three forms, namely a log, the back of a crocodile or the back of a turtle! Too much description herein would defeat the fun of the game. Take it from us that it is not easy and, indeed, gets progressively harder as one goes on. This seems to be a good month for arcade games because like Frenzy mentioned elsewhere, Frog II is very good fun to play. The scoring of the game is, of course, explained in the package, but a rather interesting feature is that levels as such are not used. As we mentioned above the skill level gets progressively harder as one goes on. It is, therefore, truly a game of skill. As an arcade type game there is, of course, sound.

ROULETTE – TO FRENCH RULES

Everybody knows what roulette is, almost everybody knows how to play it, almost nobody ever wins any money at it. There are not many simulations of the game available for microcomputers, at least that we know of, and it is really a natural for the machine. The appeal of this version is the strictness with which it complies to the actual game. The one or two microcomputer versions of roulette that we have seen have not, for instance, had the ability to cope with multiple bets. The odds paid on one number coming up are 35-1. In fact as there are 37 numbers (0-36) the odds against you winning are 36-1. It is, therefore, an audacious gambler who puts his money on a single number. This is where multiple bets come in. At an actual table one places one's chips on the intersection of the lines if for instance one is covering two numbers. There are a great number of variations of betting on a selection of numbers that one can use and this simulation covers ten of them. We are not quite sure whether this is all that is available in actual life or not. Anyway the point is that multiple betting is supported. The graphics are fair. As we all know it is extremely difficult to display anything approaching a circle on the Tandy or Genie machines. Each player is given 500 chips to begin with. You may define these as your imagination wills. When all bets have been placed (up to 4 players may take part) the wheel will spin and after the usual deathly hush a number will be displayed. The players' kitties will be adjusted and so one proceeds to another turn of the wheel. Needless to say as in everyday roulette, the numbers have colours and again, as in real life, one can bet on the colours. This is always said to be the sucker bet because one only gets even odds. We have always felt that it is one of the best bets but that is probably why we have lost money at roulette. You, however will not, if you play this computer simulation.

ENGINE DRIVER – MORE FUN THAN WITH BR

Some programs are easy to describe and some are hard. This one is hard. A simple description does not really give credit to the software for it is a fun game. On the other hand it is very difficult to bring it to a successful conclusion. If a game is too difficult, then it loses its appeal too easy and it is boring. The game is played on the screen on which is displayed various railway tracks and four stations. Going round the tracks are five trains. Various tracks may be connected to others by way of about 10 sets of points. The speed of the trains may be altered and the points, of course, may be controlled, thus the direction of the trains is under your command and the purpose is to get four of the trains into stations. We say four because the fifth is a "rogue" train – a runaway train – and you have to get all of your other trains out of the way. You cannot control it. As we have said our difficulty in describing the game really arises because, although it is a simple game in conception, it is a difficult one for playing. The graphics are excellent, the title ones particularly so. Your skill is judged by time. Assuming that you do not have a crash then a player who can park all of his trains in the station in a lesser time than another obviously is a winner. As with all of our programs this one has been test played by a number of people and it is sometime since we have received such a difference of opinion on what is essentially a relatively simple game. Perhaps this is the measure of its quality. Engine Driver comes with sound.

LDOS

There is a saying that if you do not blow your own trumpet nobody else will. Hence we are somewhat pleased to be able to announce that Tandy in the United States are recommending and selling LDOS as an alternative disk operating system to TRSDOS. As far as we know this is the first time they have ever done such a thing.

As readers will know we have been sole distributors for LDOS outside the U.S. for over a year now. We were always firmly convinced that it was and is the best disk operating system for the Tandy and Genie machines and it is rather nice to have Tandy eventually in agreement!

It is so nice to be proved right occasionally!!

ACCEL 4 — THE LATEST IN THE ACCEL FAMILY

The ACCEL series of Basic Compilers has by now achieved a certain amount of fame as reasonably priced, yet highly efficient compilers of the Microsoft Basic. They have all been written by Chris Paradine who formed a firm, Southern Software, in order to market ACCEL and his other items of software. In fact ACCEL has now become so popular, both in the United Kingdom and in the United States of America, that future manufacturing and most of the marketing of ACCEL 4 has been turned over to Molimerx Limited, although of course you can still get the product from Southern Software if you wish. The original ACCEL for Level II Basic was first released at the end of 1979. Compared to later versions it was a little slow and was capable of compiling fewer statements than later generations. The next in this evolutionary chain was ACCEL II. For the first time this supported Disk Basic and was much faster than ACCEL. A further improvement was added in February 1981 to ACCEL II, but the major new up-date was in March 1982 with the advent of ACCEL III. This was a complete new release, but still based on the unique principle of merging compiled and interpreted code to give the greatest possible compatibility with Microsoft Basic. Now in September 1982 we have the issue of ACCEL 4. One might call this the third generation because it is the first one which makes use of the DOS overlay principle. This new architectural structure renders a number of important improvements, but the most important and startling one is that, apart from a small control routine of less than 128 bytes, no user memory is sacrificed to the compilation. Essentially, therefore, the entire amount of user memory available may be used for the Object program. Other features of ACCEL 4 are as follows: —

1. Compiled code is more compact,
2. Better ease of use. Runs directly from disk, leaving user memory free,
3. Compiled program can be invoked direct from DOS,
4. Much faster compilation, especially for large programs,
5. SAVE, LOAD, RUN, supported for compiled programs,
6. Unstructured FOR-NEXT supported, e.g. IF A = 1 THEN NEXT,
7. Array references are optimised:
   - Multi-dimension
   - Variable-bound arrays, e.g. INPUT N:DIM
   - A(N)
8. INP and OUT are optimised,
9. Full chaining of compiled and uncompiled programs.

As readers will know one of the processes of a compiler is to make a Basic program run faster. With a small number of programs there will not be any great improvement particularly, for instance, when the program is continuously accessing a peripheral. It is, therefore, impossible to give any hard and fast numbers, as the speed up will vary from something quite spectacular like 20 or 30 times the speed of the original to a speed increase of next to nothing. It should also be understood that a compiled program will normally be larger than an uncompiled one. ACCEL 4 is particularly miserly with space and as mentioned above essentially no user memory is sacrificed to the compilation.

The foremost objective of ACCEL 4 is to achieve compatible execution of Basic programs, no matter what features of the language are used. The compilation process results in a program which is a mixture of Basic statements and directly executing Z80 machine instructions. The run-time routines in ACCEL 4 yield control to the interpreter when an unoptimised statement or expression is encountered, and they also ensure that the variable values accessed by the interpreter and the compiled code are consistent. No matter what options you use on PRINT and INPUT, or GET and PUT, or even if you use the more obscure functions, your program will still run. A special compile-time option enables you deliberately to suppress optimisation, across a section of program. This option is provided to improve the chance that non-Microsoft Basic language extensions will run, but no guarantee is given. The following table summarises those language features that are optimised by ACCEL 4. For an unoptimised statement (like PUT), then all expressions contained in that statement are also unoptimised. For an unoptimised function (like SIN), the contained expression is also unoptimised but the containing expressions can still be optimised. If you are considering the sale of your compiled programs you should allocate some time to the tuning of the program to the capabilities of the compiler, which are of course directly related to the capabilities of the Z80 CPU chip. Because any item not included in the following list (e.g. SIN(X) or LPRINT), will be interpreted, it may slow the program down, but it will not affect correct execution.

Optimised Functions

GOTO,GOSUB,RETURN,RESTORE,IF,THEN,ELSE,CLEAR,ON	Always
LET(assignment),POKE,SET,RESET,POINT,PEEK,VARPTR	All data types
+ — × / AND OR NOT = (and all comparison operators)	All data types
Constants, e.g. 123, 12.3,"ABC"	All data types
FOR,NEXT	All data types (i.e. INTEGER & SINGLE)
PRINT	Partial optimisation
LEN, MID$, LEFT$, RIGHT$, CHR$, ASC, CVI, MKS$, CVD, MKD$	All data types
INP, OUT	All data types
Array references	All data types and bounds

The Basic interpreter finds the locations of each variable by a sequential search through its dictionary at execution time. By contrast the compiler allocates storage for each variable at compile-time, and replaces each reference to that variable (in an optimised statement) by a direct machine address. Similarly, each line reference in GOTO or GOSUB is translated to a branch address, whereas the Basic interpreter searches sequentially through the program to resolve each target line at run-time. Generally speaking, the longer the program and the more variables it contains, then the greater the performance improvements that result from compilation.

ACCEL 4 is compatible with Tandy's TRSDOS and Logical Systems Inc.'s LDOS and smal-LDOS. TRSDOS is, of course, the standard of the "normal" disk operating systems and it is felt that LDOS is the standard of the sophisticated DOS's. Hence no attempt will be made by the author to extend the compatibility of ACCEL 4. The software market at the moment is such that the program content and quality is beginning to suffer because authors try to be "all things to all men". The advanced features of ACCEL 4 have come about in part because Chris Paradine knew which systems he was writing for. ACCEL 4 is compatible with the Tandy Model I and Model III machines, together with the original Video Genie and the Genie I and Genie II. There may well later be a version for the Genie Model III, but no plans have been made in respect of the Tandy Model II.

There are four restrictions as follows:

1. No redefinition of meaning of names. e.g. DEFSNG 1:1 = 1:DEFINT 1:1 = 1 is disallowed
2. Behaviour of error conditions is not necessarily compatible. Data-dependent errors, such as OVERFLOW, or a function argument out of range, are not necessarily diagnosed. The current line number (used in diagnosis, error handling and in trace) is not accurately maintained. Programs containing "ON ERROR" traps may not work as intended (but I/O errors are correctly trapped).
3. Editing is not possible on the compiled program. The commands AUTO, DELETE, EDIT, NAME, CSAVE, CLOAD and MERGE, cannot be used. NEW, CLOAD OR LOAD must be used to reset the machine to its normal state.

As we have said, ACCEL 4 is compatible with the Microsoft Basic used in the machines mentioned above. Because of this the user gets the advantage of both interpretation and compilation. He already has the interpreter in his machine and ACCEL 4 provides the compilation, hence programs are able to be modified and debugged in the normal way using the resident interpreter. When the user is satisfied with the program, it is compiled. Calling the compiler is extremely easy. It is only necessary from Disk Basic to type CMD "I", "ACCEL". ACCEL 4 supports the commands SAVE, LOAD and RUN in the compiled program, but not CSAVE or CLOAD. A compiled program can be sent to tape but a separate utility such as TSAVE would have to be used.

HELP – LDOS ASSISTANCE

This program is for LDOS owners only. It is made up of two components; the first is, of course, a disk with the software on it; the other is a quick reference card. To deal with the latter first. We find it of rather poorer quality than one normally associates with LDOS material. Unfortunately it is printed with blue ink on blue stock, so the print does not show up as well as one would like. On the other hand it was composed by Roy Soltoff, the prime author of LDOS, so it does have considerable authority behind it. Most LBasic statements, incidentally, are also listed. Whatever the quality of the card, there is no doubt it does what it sets out to do. The disk contains a series of Utility programs which explain LDOS system commands and syntax to an LDOS user. Eight files are contained on the disk, the first five entitled HELPA, HELPB, HELPX, HELPLB, HELPP, explain, respectively, the Library A functions, the Library B functions, Utility/Driver/Filter functions, LBasic functions and the Partitioned Data Set functions. The other three files are SYNL, SYNX and SYNB. These explain the syntax respectively for the Library, Utility/Driver/Filter and LBasic packages. All of these files are called with a command which indicates the file program about which a query is being made. Thus, for instance, the command from DOS, HELPA (SPOOL), will display on the screen a description of the Spool function of LDOS. The command SYNL(SPOOL) would display on the screen the syntax of the SPOOL command. Abbreviations may be used for the parameter, thus SPOOL may be reduced to SP. It is possible to build one's own HELP type files, but this does require the user to own the Partitioned Data Set program described elsewhere in the catalogue. Whether or not one uses HELP is, we imagine, mainly a matter of taste. Frankly to us it seems a little extraneous. One of the beauties of LDOS is its manual and this program does not really provide anything more. It is useful if the manual is not around or if, due to its bulk, the owner would prefer to use this Utility.

DATA-WRITER – A NEW CONCEPT IN DATA MANAGEMENT

We use above the word ''new''. We should not, because the method of database management used by Data-Writer has been used on Main Frame computers for a long time. Actually, a Main Frame database management program does not construct a database as such; it assumes that a database exists. Most microcomputer database management programs have the writing, construction and management of the base all in one program. The very description ''database management'' means just that – management. If you have a company that is concerned in the business of office management, then it does not build the office, but manages it after it is built. Offices are best built by expert builders. Databases are best built by word processors. In other words, a true Data Management program will devote its space to managing the database and doing a lot of other manipulations on it without concerning itself with actually constructing it. In this way, different sections of the base can be operated on and a large quantity of weird and wonderful things can be done with it.

Having gone through all this preamble, we should hasten to say that, although Data-Writer does use the concept of managing a database, it also has an ancillary file by which the database itself can be constructed. Making your database with the Entry program is perfectly viable, but it does have at least one restriction, namely that the field length using Entry is restricted to 35 characters. With a word processor you can include up to 240 characters per field. Furthermore, with a word processor variable length fields will be recognised whereas with the Entry program of Data-Writer one must stipulate the length of the field. In other words, only fixed length fields are supported. In addition there is no doubt that entering data into a computer per se is easier with a word processor than with any other sort of program. One has complete control of the file and, as everybody knows, one can alter, move around and enjoy complete freedom within the database until such time as one is satisfied with it, whereupon it can be filed away. The Entry section of Data-Writer is quite full, as we shall find out in a minute, and certainly does not cause any great problems to the user, so the point of using a word processor is that one does get, firstly, variable field length and secondly, a slight increase in ease of usage.

This, therefore, is the first major point to be made with regard to Data-Writer. Although it is self-contained and is perfectly viable in that context, it does support the use of an external word processor. The latter, incidentally, may be any word processor that produces a pure ASCII file. AJEDIT, for instance, is quite compatible, so is SCRIPSIT so long as the ASCII saving option is used with the latter. Many other word processors, indeed, by far the great majority, output their files in pure ASCII. The odds are that if your word processor runs on a Tandy or Genie, its files will be compatible with Data-Writer.

There are very few restrictions with Data-Writer, but perhaps we should get the statistics out of the way first. Throughout this description we will be using the normal terminology for databases, that is to say, a file is made up of a collection of records. A record is made up of a collection of fields and a field is one data entry. Taking the rather hackneyed example of a mailing list, the complete list is a file, each collection of a name, address and so on is a Record and the name is a Field, as is the town, as is the street address and so on. So, working up from the bottom, we go Fields, Records and File. The maximum number of fields permitted in a record is 20. The maximum field length using Entry is 35 and using a word processor is 240. Each field, of course, has a label such as ''Address'' or ''Name''. The maximum number of characters per field label is 20. Shortly, we will be describing the individual sections of Data-Writer when these following statistics will make more sense. But to get them out of the way now; the Maths section will allow up to 20 equations per run and each equation can contain up to 255 characters. The Maths sub-program maintains 10 scratch pad memories, carries out its functions in double precision and, therefore, is accurate to 16 decimal places. A strong feature of Data-Writer is its ability to Mail Merge. That is to say, construct (with or without a word processor) and handle form letters, into which various personalisation selections or names may be automatically inserted, such as a name to following ''Dear Mr''. Data-Writer supports up to 20 different such insertions per letter and the maximum length of a form letter is 6,000 characters, which we are reliably informed, is about two and a half A4 sheets. The Sort sub-program will handle up to 4,500 records at one time. So far as we can see, the actual size of the databases is unlimited for it may be split up into a number of files which can be resident on different disks. We imagine that the real restriction is the Sort maximum of 4,500. Although one can spilt one's database up into, say, half a dozen sections, each section will have to be 4,500 records or less if a Sort is to be carried out. These, therefore, are the vital statistics of Data-Writer. We will continue to a description of the software itself.

Introduction

It is sometimes difficult when one has spent many days and weeks assessing a piece of software and has had input from a number of different testers, to stand back and try and see the wood rather than the individual trees. Probably the one general thing that is outstanding about Data-Writer flows from the original concept of having a database ''separate'' from the management program and upon which the latter operates. Everything is neat, tidy and easy to use. Like the surgeon, Data-Writer operates on the database with instruments which are easily selected and easily to hand. If you want to sort the base, from DOS you type SORT; if you want to edit it you type EDIT and so on and so forth. It is all neat, tidy and logical. Maxi Manager is the database management program that has been the most popular prior to Data-Writer and there is nothing wrong with that software, but it is a bit complex. It is not really tidy. One is often left saying to oneself ''I wonder if I did that right'' or ''why should that have happened''. With Data-Writer, we were never in any doubt. With many databases the disk drives seem to be continually thrashing around. With Data-Writer you are using one particular instrument (program) at a time. When you finish with it you put it down and perhaps choose another one, but you are not continually trying to juggle a scalpel and a pair of pliers at the same time.

Without a doubt, the best language to write data manipulation programs is in a high level language. On the other hand, as we all know, Assembly code works an awful lot faster. Data-Writer was written in Basic, but it is Compiled. It therefore incorporates the best of both worlds.

The history of documentation for database management programs has not been a happy one. They seem to vary from the incredibly obtuse to the inefficiently basic. We should not really go into documentation in the catalogue because it would seem that there is nothing which raises the hackles of a computer user more than a description of program documentation with which he does not agree. Parenthetically, at great cost and trouble, we had to produce a separate beginners' manual for AJEDIT before the popularity of that word processor could be realised. Now we are getting letters complaining that we are talking down to users! It really is a field in which the software vendor cannot win, so no doubt some of you will disagree, but in our opinion the documentation of Data-Writer is good. It is

simple, concise, well printed and well presented. It comes in an A5 binder and approaches 100 pages in length. Each section of the program suite is first of all summarised and then described in more depth. Indeed, we have some evidence that, at long last, we have found documentation that might be to everybody's taste!

Data-Writer is made up of 10 separate sub-programs. Each performs its own function and only interacts with another section by way of the database itself. As we have said, this gives a nice, logical, easy approach. We will try and follow the format of the manual in describing the software, in that we will take each sub-program separately, first of all summarise its function in the context of the whole and then give some details as to its operation.

Before we do so, we should make one point about the usage of a word processor because, of course, that is not included in the package. As we have said, the only requirement of a word processor is that it should be capable of outputting a pure ASCII file. Each database file must have as its first record the field names. Subsequent records contain the actual data. The records are then separated from each other by two full stops. The end of file or end of base terminator is four full stops. Assuming, therefore, the nonsensical database of one record containing two fields it would look something like this:

```
NAME
PHONE
..
J Smith
123-45678
..
....
```

The filed identifiers are NAME and PHONE and in our file we have one record containing Mr. Smith's telephone number. As you will see, it could not be easier to write such data with a word processor and that really is all that has to be done.

Data-Writer, therefore, is a database manager that can be used with your word processor or by itself as a complete stand-alone system, the purpose of which is the management and manipulation of text and numeric data, including support for Mail Merge; labelling; mathematic inter-relationships; reports, such as inventories; accounts; stock, mailing lists and so on ad infinitum. Data-Writer is made up of the following 10 sub-programs which we will call sections:

ENTRY

This section allows the user to enter into his database additional records or to construct a database from scratch. In the preceding descriptions we have rather emphasized the use of a word processor. This may be biased because it is the way in which we work here. Entry, however, provides features of its own which are not available from a word processor. For instance, it can perform several different types of data validity checks. These will reduce input errors to a minimum. The feature becomes of particular importance when considering the operation of Data-Writer by inexperienced operatives. In addition, Entry has features to increase the speed of the data entry process including repeating fields and an abbreviation look-up table. A field may be defined as mandatory. If this is done then the program will not allow the operator to skip over the field when entering data. The validity checks are six in number, although perhaps one should say five because the first one is a ''No check''. These checks include examination of the length of the filed; whether the filed is numeric, alpha, or both; whether the formatting of numeric fields is to two decimal places and so on. The abbreviation look-up table may contain up to 100 abbreviations. This, incidentally, can be a very real advantage. It is quite surprising the number of duplications that appear in the average database. The Entry section also supports an audible signal to indicate an error. Thus, whenever an invalid entry is attempted to a field for which validation has been defined, Data-Writer will generate a tone through the cassette port of your computer. If you attach an amplifier to this, an audible signal will be made whenever an invalid entry is made. Data entry using this section is quite straight forward. The arrow keys are operative for cursor control. The program is normally in what is called the overwrite mode. In other words, if an entry has been made or already exists then typing a letter will overwrite the previous entry. There are Delete and Insert modes whereby existing characters may be deleted and new ones inserted. Entry, therefore, contains a mini text editor which carries out all the necessary functions but does not add the luxuries of a word processor.

EDIT

This section enables you to edit or review your data without using a word processor. You are able to correct errors and also to keep the information in your database current. It can be said that Edit is a mini word processor customised to edit databases rather than to edit text. One particularly useful feature of Edit is that it will permit you to edit a database of any size, limited only by the amount of disk space available. When a database is too large to fit into memory Edit uses an Input and Output file so that you can edit the database in sections. The use of Edit is straight forward and follows what might be described as a typical database editor. The four arrow keys are used to move the cursor and full scrolling is supported. In a similar way to the Entry section, Edit is normally in overwrite mode and thus the replacement or edit of incorrect characters is very simple. The current column number of the cursor is available at all times and perhaps, more importantly, so is the current record number. Edit, of course, supports an Insertion mode, but it also supports a Line Insertion mode. It supports deletion in the normal way and it additionally supports the deletion of all characters from the cursor position to the end of the current field. There is a command available to delete an entire field regardless of the cursor position and to delete an entire record. As we have said, scrolling with the arrow keys is supported, but so also is automatic scrolling. Edit enables you to search for a particular record in your database, which is probably an additional plus for using Edit over a word processor. String search is supported and string replacement. All in all there are some two dozen Control key functions in Edit.

MANAGE

Manage is the section that gives you the capability to restructure your database. Fields may be deleted and created, separate databases or files may be merged and large databases may be divided into two. In other words, Manage enables the user to adjust his database for previously unanticipated changes in format and contents. Manage, therefore, gives the user three choices. The first to manipulate fields, the second to merge databases and finally to split databases. We will deal with these separately:

Field Manipulation

The ability to manipulate fields is one of Data-Writer's most powerful features. It often comes about that the user will need to add new fields or delete old ones. Sometimes two fields will need to be merged into one field to make room for new information. The functions available are:

Insert a new field
Delete a field.
Swap the positions of two fields.
Move a field to a different position.
Append one field to another.
Restore the format of the file.

We will not go into detailed explanations of each of these. They are self-explanatory. We would, however, ask you to bear in mind that, particularly the abilities to swap, move and append fields are very powerful indeed.

Merge Databases

It quite frequently comes about that it is convenient to merge databases but not many Management programs allow this to be done. To give a simple example; one has two files, one of customers that have ordered many items, one of customers who have never ordered. Sometimes you will want to mail out a form letter to one or the other, but sometimes you will want to mail to them all. It is true that most programs will permit you to mail first to one and then to the other, but it is far easier if one also has the ability to merge the two files together on the disk so that, without the necessity of re-entering the data, one can merge the two into one large database.

Split a database
For one reason or another it is often found that a database has grown too large. This sub-section will take care of that problem. As we think you will see, and as we have already said, this section is very powerful. There are virtually no restrictions on its use except for the obvious one of having the same field structure in different databases.

STATISTICS
The statistics section has a number of different functions. Principally it will check your database, proof-reading each record to check for format errors. Each of the sections of Data-Writer has its own error checking and reporting functions, but the Statistics program does provide a final method of reporting errors prior to the actual printing of letters, reports or labels. In addition to its ability to check for format errors, Statistics also reports vital information that you will need in order to use other sections effectively. Finally Statistics may be used to print or display the entire database.

MATHS
This section is a sophisticated program which allows the user to calculate fields and manipulate data within the database. It is extremely versatile, very flexible and tremendously powerful. Although these words comprise a number of superlatives they are not overstating the case. With Maths you may enter equations, freely mixing field labels and numeric constants, addition, subtraction, multiplication, division and exponentiation can be used in your calculations. Each Maths procedure may utilise up to 20 equations. In addition there are 10 scratch pad or temporary storage locations where you can store intermediate results. The mathematical manipulations which you require are kept in a Maths' Procedure file, which consists simply of a set of equations that you want performed on a particular database. These may be saved to disk for future use. The use of mathematics in a database is, of course, very desirable but it has so many applications that it is difficult to describe it properly. The easiest way is to give an example. Assume that four of the fields are entitled Parts, Labour, VAT and Total Due, then an equation may be:

VAT = .05 * Parts
Total due = VAT + Parts + Labour

There are literally millions of equations that one can make use of in a database depending entirely on the contents of that base. Obviously statistics is a prime example, but so are many other everyday matters. How about keeping a running total of the cost of your wine cellar! If you are not into wine, the running cost of your record collection. Whole home budget programs can be written simply by constructing appropriate equations and entering in your bank details to Data-Writer. Whole business accounts can be put on Data-Writer. The mind boggles at creating a database containing ''vital statistics'' of males and females. With the appropriate equations one could select for a marriage bureau. Anyway you get the point. Equations are tested for validity as they are entered into the system. Parenthesis is not supported, but we would once again emphasize that numeric constants and field labels may be mixed at will.

SELECT
Again this is a very powerful section of Data-Writer. It enables you to isolate carefully chosen records within the entire database and create a Data file of the selected information. The obvious application of this section is to select names and addresses for targetting sales letters, reports and so on. If your database includes the sex of a person then there is little point in sending advertisements for lipstick to the male part of your list. Many other obvious examples come to mind. Most importantly, Select supports logical relationships. These are essentially the same as those in the interpreter of your computer, namely:

1. Equal to
2. Less than
3. Less than or equal to
4. Greater than
5. Greater than or equal to
6. Unequal to
7. Equal to the right part of the string
8. Equal to the left part of the string
9. Equal to any part of the string

Assume that your database consists of our old friend the mailing list and one of the fields is the county, then: SELECT IF COUNTY = SUSSEX will pull out of the database all the people that live in Sussex. The right and left string manipulations may not be quite so obvious. Normally it is advisable to construct your database with the fields containing the lowest possible common denominator. Assume for a minute that your business is particularly concerned with the sex of a person, then a perfectly valid database is Mr. J. Smith or Mrs. J. Smith. Selecting by the left part of the string will differentiate between the Mr. and the Mrs. Perhaps you wish to select doctors, then with the left string command you will be able to find them. The reason that we mention the lowest common denominator is that it is probably more efficient (if there is no problem with the number of fields being used) to make the title, that is to say, Mr., Mrs., Dr., into a separate field. If you do this, then, of course, you do not require the string selection because the title will be one entire field. Anyway, once again the possibilities with this powerful section are unlimited. Supposing we want to select from our clients list (assuming we are Stock Brokers) all clients that do not have investments in BL or ICI, then:

SELECT IF INVESTMENT «» ICI OR INVESTMENT «» BL

The above is powerful, but consider combining these manipulations with those of the Maths program and what you can achieve is quite astounding.

SORT
The Sort section is self-explanatory. It will reshuffle the records of the data into a new order for some specific purpose and then write out, if required, the new ordered file. The Sort in Data-Writer is a two level sort, in other words, a sort within a sort. Each level may be sorted in alphabetical or numerical sequence and in ascending or descending order. The maximum number of records which Data-Writer can sort at one time is four thousand five hundred. Sort has one unusual feature which is of particular use and that is the ability to extract a last name from a line. Hence if a field consists of a first, middle and last name, the latter may be extracted with a high degree of accuracy due to special software which examines a name field and separates out the last name. It is very difficult to give any speeds for Sort. When we tried it, it seemed to be very fast, but the problem is to construct a database of sufficient length to get a meaningful reading. We made one of 100 random names and it Sorted it in an immeasurably short time.

LABELS
Labels, somewhat obviously, is the section which allows the user to print mailing labels. It has a number of sophisticated features. For instance, one can select printing formats of one to four labels across. A label format file can be constructed and saved to disk for future re-use. The format of the labels is completely adjustable and address labels can be printed from a number of different files at the same time. If, for instance, one has a database made up of three files, then one only has to enter those file names and all the labels will be printed. You may stipulate all of the following.

The number of blank lines separating labels.
The width of the print zone on the label.
If you are printing more than one label across the web then you will have to define the number of blank spaces between the labels.
You may adjust the left margin as you wish.

In addition to the above formatting options you may define a preset string. This allows you to print a common line on all labels. For instance, ''The Purchasing Agent'' or whatever. After all of this house-keeping has been done, the user may define each field from the database he wants to print on each line. Provision is made for a printer test and printing of the actual base may be stopped at any time. We do not know of a more versatile formatting program than this section of Data-Writer.

LETTERS

We are all well acquainted with form letters of one sort or another. Every sales outlet seems to vie with the other to make a solicitation more and more personalised. Whether or not it is a service to mankind, Data-Writer continues this course. You may create the form letter, the report or whatever with your word processor or you can use the fairly straight forward text editor contained in this section of Data-Writer. Pretty well the only stipulation is that the letter must be less than 6,000 characters in length. We have the greatest difficulty in thinking of a useful functional feature for mail merge procedure that is not contained in Letters. Every part of the letter can be customised or personalised at will and this is not even restricted to the data contained in the database because Letters has provision for pausing the Run so that a particular phrase, date or whatever can be inserted from the keyboard for a particular letter. This may then be used for all letters or just kept to the current one. As we have said, Letters contains a text editor or mini-word processor. We will not go through the various commands; suffice it to say that there are about 15 by which pretty well any formatting requirement can be chosen. Letters contains a provision for calling the name and address twice so that an envelope may be printed at the same time as the letter. The mini-word processor supports sending special Control codes to the printer and many other features, including some dozen or so Control key functions in addition, of course, to the arrows.

REPORT

This section is used to print a report of information from any of your data files. The report format may be created by either using your own word processor or the mini-word processor in this section. Incidentally, although a number of the sections contain mini-word processors they are all self contained within a section. In other words the drive thrashing which we mentioned in the context of other database programs is kept to a minimum. Indeed, it is pretty well non existent. The reports printed by Data-Writer may be as simple or as complex as you wish. Some planning will be required of course. Particularly attention must be paid to the length of the fields, the column widths and so on. This is made somewhat easier by the Statistics section already described, which has a listing of all of the field labels and the maximum number of characters in each field. There are four major parts to any report file, the parameter, heading, formatting and sub-total.

Parameter

The parameter sub-section consists of imbedded commands containing the format codes controlling the printing of the text. They determine the shape of the page and tell the program what limits have been set for printing. There are several formatting commands.

Heading

The heading sub-section decides what will be printed at the top of each page on your report. Again the headings may be as simple or as complex as you wish.

Format

The format sub-section describes how the columns and rows of data in the report will be printed. For instance, it is obviously important to get all the decimal points under each other. The format sub-section will take care of this. It is also important that words be blocked to the left or to the right. In other words this sub-section takes care of the house keeping of your report.

Sub-Total

If you want your report to include sub-totals then you simply type in the name of the field you want to use to break the report into sub-totals. There are the usual number of commands available in the mini-word processor part of the section. The big advantage of the sub-section is that it enables complex report formats to be put together. Obviously the more complex they are the more thought you will have to give to it, but Reports will give you all the details to complete the job.

Data-Writer is compatible with Model I and Model III Tandy machines, the original Video Genie, Genie I, Genie II and Genie III, although we have not as yet had sufficient experience on the latter to be sure. It is, of course, a disk orientated program. It is most important to note that it requires lower case. The authors have been kind enough to leave the software unprotected for the benefit of the customer and it only requires to be backed-up. We are **not** prepared to accept the return of Data-Writer should customers order it when they do not have the lower case modification in their machine. The program will not work without lower case and it is the users responsibility to make sure he has that modification. Compatibility with double density drives is a little uncertain at the time that this list goes to press. Our present information is that the database itself may be written to and accessed from double density, but the programs require single density. Customers are asked to telephone us if this is an important factor in their buying decision. Data-Writer is supplied for the Model I on three disks and for Model III on two disks. On the Model I it is compatible with TRSDOS and LDOS without modification. Other disk operating systems will require patches. This comes about because of the incompatibility of the Microsoft Basic compiler used. As customers will probably know, Microsoft has, to say the least, been very slow in even recognising the existence of the Tandy Model III machine. They still have no compiler for it. Consequently the Model III version of Data-Writer is supplied on a proprietory disk operating system and it would be best to consider it totally incompatible with other Model III DOS's. It certainly is with TRSDOS. Thus Model III users should for safety sake plan to use the DOS supplied with Data-Writer. This does not necessarily extend to word processor users. For instance, we have constructed files with AJEDIT running under LDOS which are compatible with the Model III Data-Writer.

UNDERWORLD – BE A BADDIE FOR A CHANGE

Underworld is unashamedly a board game. It is neither an arcade nor an adventure type of game. Its interest really comes about because of its subject matter. There is a certain fascination about trying to win a game as a crook. It is quite an involved game and if one wanted to take a short cut in its description, then it would be to liken it to other well known board games, such as Monopoly. It is similar to that particular game in that the crook's exchequer is increased by either 40 or 20 thousand dollars each time the player passes the Start position. It is an interesting commentary that the game is played in dollars even when it is written by an English author. Perhaps he feels the chance of the crook succeeding is greater in North America! However that may be, Underworld is played by 2 to 4 players. Progress round the board is by way of a random number generator, similar to throwing a pair of die. At the beginning of each player's turn a status report is displayed giving the number of distilleries operating (we are in the Prohibition Era), the number of protection rackets operating, the takings of both and so on and so forth. The board positions are some dozen or so in number, varying from the start and passing through airports, casinos, banks, black market and even including a Chance position. The distilleries must be operated; another interesting commentary is the fact that one is permitted to rob other players. Good fun and it is a change to have a game for more than one person.

LDOS NEWS LETTERS BACK NUMBERS

At this time we have a small stock of all of the back numbers of the LDOS News Letter. The first one is in very short supply and we are not at all sure that we can get any more. Numbers 2 to 5, however, so far as we know, will be available for a while. The charge for these is £4.00. There is no V.A.T., but shipping is 50p each.

QUICKPRO-PLUS — AUTOMATIC PROGRAM GENERATOR

Quickpro-Plus is a file orientated Basic program generator. That is to say the user decides upon the type of program that he wants, gives QP + the details and QP + writes the program. The most widely publicised of such program generators is The Last One (a Registered Trademark of D.J. A1 System Ltd.) and it is, therefore, inevitable that QP + will be compared with it. There are two approaches that one can take in writing software like this. Either one can set out with a very broad brush and try and make the generator capable of producing a wide variety of data handling software or one can restrict it to some extent, to simply producing file handling programs. The Last One seeks to go the first route, QP + goes the second. There is a great paradox in this software if one thinks about it. Obviously, if a person is at least a semi-skilled programmer then he does not need a program generator. They are really for people who are not skilled in programming and want that chore taken off their hands. The paradox is that programs like The Last One, by being all things to all men are also complex in use and one therefore gets the position of a program aimed at a beginner, but actually requiring some skill to use it.

It was because of this apparent paradox that QP + came into being. It is written for somebody with little or no knowledge. You will find no mention of flow-charts and little mention of fields, records and other technicalities. It was written so that a person could sit down in front of his computer, answer a few questions and have a program produced for him, and this is exactly what QP + does. The other side of the coin is that it concentrates entirely on producing file handling programs. You may feel that this is not too much of a problem for in a data processing program it is the file handling part that is the most boring to code and also the most difficult to debug. Actually QP + will do other things which we will explain in a minute, but basically it produces a program which will handle all of your file access and arrangement. You will be able to add file records and you will be able to search for, locate and retrieve these records as and when you wish. Additionally the program which is generated will be able to up-date and change the records and, of course, delete them at will. In addition various calculations and mathematical manipulations may be carried out on the individual fields of the records, although the fields, of course, must be numeric. Up to 50 separate computations can be carried out on these fields and the program will report to you using any of the normal mathematical functions. In addition to generating the program QP + can provide automatic documentation for the generated program and it also has extensive report program generation facilities. Finally, it provides a means of making existing data files which the user may already have, written by other programs, compatible with programs generated by QP + . Let us, however, go briefly through the various functions of QP + .

Program Generation

QP + obviously has to be given various items of data so that it can construct your program for you. The first thing that you do in this respect is to design the screen lay-out. When this option is chosen a blank screen will be displayed, except that down the left-hand side of it are the letters of the alphabet. The operator designs the screen in the particular form that he desires by entering the letter of the appropriate line. The data entered on the screen, for instance, will probably consist of a title and then perhaps various field names such as name, street address, town and county. If you decide that you want the word ''Name'' on line D, then you tell the computer this and move the cursor along so that the computer will know where you want the word ''Name'' to start. You will also wish to define the number of characters that can be entered into each field and provision, of course, is made for this. In this way, a total screen is constructed very easily with a minimum of fuss and bother. Programs created by QP + allow the operator to add to and update files. Before a record in a file can be updated it must be located. Hence QP + enables the user to define what item in a file record will be used to locate or access the record in the finished program. If you decide that you would like the Name to be the key then you designate this field as a primary search key. Later QP + will create a special indexing file that will enable the user to gain very fast access to these records. The next stage is to assign numeric fields. It is necessary, of course, for the ultimate program to know which fields in a record will contain numeric data, if only so that it can carry out calculations on those fields. Therefore you must tell QP + which fields are to be numeric. Whilst you do this, QP + enables you to specify the format of the numeric only fields. In other words, the manner in which the number will be displayed, similar therefore to the ''PRING USING'' command in Basic.

So now we have designed the screen, entered the field titles, defined search keys, designated numeric only fields and settled the format of the latter. QP + is so easy to use that all of this will have literally only taken a few minutes, and yet a large amount of the work is already done.

The next item to which we must turn our attention is the calculation and accumulation fields. QP + asks you at this point whether you require any calculation fields and you answer accordingly. If it is affirmative then you are asked to designate the number of the field (all of the fields which we set up originally had numbers). You will then be asked for the calculation required. As we have said, a large number of mathematical manipulations may be carried out, but basically they are comprised of adding, subtracting, multiplying or dividing numeric fields with one another and with other numbers. The calculation is entered in a simple equation-like form. Supposing, for some reason, one wanted to multiply 10 by the contents of field number 3, one would enter 10 * F (3). If you wish to divide field 1 by 10 and add the result of field 3 then the equation would be F (1)/10 + F (3). As you can see these are logical and are not very difficult. After the calculation is entered the program will test it and give you an error message if it is not capable of being carried out. An accumulation field, incidentally, is just that. It is a field in which running balances may be accumulated. That is about all there is to the calculation entries. Again we would like to emphasize how simple and straight forward it is. The next stage is an optional one. You may enter in what is called a Field Comment for each field that you have created on your screen. A Field Comment allows you to describe in detail just what information is contained in a particular field. Up to 30 characters may be used. The description you enter will appear in the program listing that QP + will create for you and will help you to locate particular parts of your program.

Believe it or not, we are nearly finished. It only is necessary to assign names, both to the data file which QP + will generate and also for your new program. Although not concerned with the actual generation of the program, one further friendly feature is allowed for, namely that you can print out to a line printer a copy of the screen you have created. You may find this handy for future reference. After you have accepted or denied the screen print option, QP + will go to work and generate a program from the information with which you have provided it. You need, of course, do nothing at this stage, and QP + will automatically return to its Menu when everything is done. At this stage your new Basic program has been generated and completed. It may be LOADed, RUN, LISTed or copied in exactly the same way as you would other Basic programs.

Using Your New Program

As we have said, RUNning a generated program is exactly the same as running an ordinary Basic program. Your new program will allow you to add, update or delete data from a Data File, which you named when you first generated the program. When the new program starts to run you will see the screen format which you designed earlier on. At the bottom of the screen will be displayed the functions which you can perform, namely Add a Record, Get a Record, Search and End Program. Options are chosen by typing the first letter of the command. If, for instance, you wish to add a record, then you would type the letter A. As your Data File at the moment is virgin, it would be better if you started off with this command in any event. So after you have typed A the cursor will position itself to the first input field and wait for you to enter data into that field. Entries are terminated with the Enter key. Numeric only fields will only permit the insertion of numbers. Anything else will simply not be accepted. When you have finished, the record will be filed to the Data File which you designated in the set up procedure. If you make an error you can back up after one record has been entered and the procedure starts all over again. To get a record you type in G. You must enter the key for which you are searching and the program will go off and find the correct record for you. You will then be given the option to Change or Delete this record. Editing is done by moving the cursor from field to field. To delete, you simply hit the D key and the record is gone.

The third option is to Search the File. This is a string search, which means that any record containing the characters or number you are searching for will be accessed by the program and displayed on the screen. The fourth option of Ending the program is self-explanatory.

Automatic Documentation
QP + can print out for you an Instruction Manual for any program which it creates quite automatically. There is an option in the main Menu for this and, if you choose it, then, after confirmation that a printer is connected, you will be asked for the name of the program for which you want to print instructions. So long as you have not erased the Screen File from the disk or removed the appropriate disk, the program will go to the appropriate file and print out a set of operator instructions on how to use the particular program specified.

Report Program Generator — Quick Print
Quick Print is, to some extent, a separate program from QP + , but in any event is a most important section of it. It is accessed from the main Menu. QP will create a separate Basic program that will print a report in as many different formats as you may design. These reports may be used to list information that you have in files created by the program which was created by QP + . So long as the Screen File mentioned under the previous section is resident in the system then QP will be able to produce a report. QP starts by asking whether you want to use an existing file or go away and create a new one. If you choose the latter then you will be returned to the program generator QP + . Assuming, however, that you have a file already made then QP will find it and you will be shown the screen which you originally created. If you wish, you can eliminate any fields from the Report program which you are creating. So, this is the first question you are asked, whether or not you wish to eliminate any fields. When, either at the start or after designating some fields, you answer the question in the negative, QP will proceed to the next section and you will be asked to enter the heading for each of the fields which you did not eliminate. The field headings may only be as long as the maximum length of the field for which you are entering a heading. QP will, however, look after this chore for you. Each report that you create can have a special heading or title. You will be asked for this and you will also be asked to give your Report program a name. You are able to custom design your report with QP, so the next question which you are asked is to specify the width of the report. Any width may be specified up to a maximum character count of 132. QP will let you spread out your information in the report to cover two lines if you wish. If QP finds that the information is too long to fit onto one line, then it will ask you to give further information. QP also allows you to specify the number of lines printed on a page and this information will have to be given to it. The program then will automatically number each page of the report and print whatever heading you give it at the top of each page. In many cases it will be desirable to have a report total columns of numbers. QP will prompt you for the necessary information. In a similar way to it being handy to have a screen print of the screen when using QP + , so it is handy to keep a copy of the report worksheet. If you want this it will be printed out for you, displaying the page title, column headings, field numbers and field formats.

Using Your Report Program
The Report programs created with QP operate in much the same way as do the Filing programs created with QP + and it really is not necessary to go over the procedure again. Two options are given to you. When the program is run it will print out the stored data which was originally filed away by the program created by QP + . You are given the option to Get or Search for records and you will be asked for the key that you want for records to be printed in your report. Your report will only contain those records which have, as their key, the key which you have specified. The key, of course, is the one originally specified in the original QP + program. If you specify a Search then you may either print the entire file or print only those records which have the information you want to search for.

Quick Index
You may have filed data that you have created from a program other than the one that you wrote using QP + . The QI utility can be used to make your data assessable by programs that you create with QP + . Assuming that you have called QI and that the appropriate data file is in the system then, on entering QI, you will be asked for the data file's name. You will be called upon to enter various items of information so that QI may know the general format of your file. That data file must be in a non-compressed ASCII form which, of course, most data files are. However, no guarantee is given that your specific data files will be able to be manipulated. We have as yet not experienced any difficulty, but obviously neither we nor the authors of QP + know what files you may have. It may, therefore, be fairer to say that QI is an attempt to provide for data file compatibility.

In summary, therefore, QP + is an extremely good attempt to achieve a balance between the complexity of many program generators and what is the ideal, namely total ease of use. It will perform its program generation, report and indexing duties efficiently with a minimum of user intervention, but when that intervention is necessary, it will be found to be an easy piece of software to get along with. QP + is available for Models I, II and III Tandy machines. It is also, incidentally, available for the IBM Personal Computer, although at this stage we are not sure we will be stocking this version. As there is a Tandy Model I version it is compatible with the original Video Genie and the Genie I and Genie II machines.

AJEDIT — NOW COUPLED WITH smal-LDOS

AJEDIT has now been up-graded so that it is compatible with the functions of the Keyboard Driver of both LDOS and smal-LDOS. In order to make these functions available to customers without their having to go to the cost of a full LDOS, AJEDIT is now being sold with a complete package of smal-LDOS and the price of the latter has been reduced by some £8 so as to promote the package. The new functions are present in all versions of AJEDIT sold by us after 31st August 1982. Accordingly if you already possess LDOS then you will be able to use these additional features. So as to assist customers who are in this position a normal update is available. In other words if you possess LDOS or smal-LDOS and AJEDIT you can send the latter in for an update and get these additional features. Alternatively if you do not own AJEDIT, but do own one or other of the operating systems, the version that you buy after the date mentioned will support the features. Finally if you do not own LDOS, smal-LDOS or AJEDIT then the purchase of AJEDIT and smal-LDOS as a package gives you some financial gain. There are four obvious advantages to this new version and they all come about by way of the use of the Keyboard Driver in either LDOS or smal-LDOS. With one exception the features are built in to the interpreter of the Model III and hence these improvements are chiefly aimed at Model I owners. The features are as follows:

1. **Key Repeat**
   Keeping a key depressed for longer than half a second or so will cause that key to repeat on the screen. If the key being pessed is a Control key, such as a down arrow, this also will be repeated. We use this example because it is a particularly useful one when scrolling.
2. **Type Ahead**
   This feature maintains a buffer into which key strokes are placed if the machine is busy elsewhere when a key is pressed. This has many obvious advantages, but one particular one with AJEDIT is that in the regular version it is possible to outstrip the program, particularly as it appraoches the end of a line. It is at this time that AJEDIT has to do a lot of house keeping and a reasonably fast typist could outpace the program, resulting in lost letters. With Type Ahead it should not be possible to do this. As far as we know the Type Ahead is active all of the time so it has other advantages apart from keeping pace with the typist. For instance, we frequently use it to type in a command whilst the machine is accessing the disk. The command is then ready on the screen for activation when the machine comes back from its work.
3. **Screen Print**
   This is a self-explanatory feature. When a certain key is pressed the contents of the screen are routed to the line printer. A particular advantage of this feature is the ability to obtain hard copy of text files, in other words files containing the control commands.
4. **General**
   The new version of AJEDIT, unlike its predecessors, supports a number of the features of LDOS and smal-LDOS, in the sense that it will allow such features to be active whilst AJEDIT is being used. The most obvious is Double Density but other commands from these two disk operating systems are also now available to the user. Proper error recovery from, and access to, LDOS is supported with the new version.

FRENZY — AND IT REALLY IS

This is a very good arcade type game from the same author, W. Mansell, who wrote Sea Wolf, which was featured in our last list. One can really view Frenzy much as one wants to. When the author first sent it into us he described the screen as having five levels of scaffolding, each connected by ladders. This may well be the best description, but it does seem to us that the screen display or play area can be described in a lot of different ways. Anyway, keeping with the scaffolding and ladders, the idea is that each layer of scaffolding contains a number of bricks that have to be collected by the player who is in control of the little figure dashing round the scaffolding. Unfortunately, Mr. Mansell has laid on a number of monsters, contact with which is fatal to the player. Lest you think the game is restricted to collecting bricks and fighting monsters, it is possible for the player to dig holes in the path of the monsters, the latter fall through and for a little while are out of the way of the industrious brick collector. Control is with the four arrow keys. A certain amount of ''Type Ahead'' is programmed in, thus, for instance, if one presses the right and up arrows at the same time and keeps them pressed, then the little man will run along to the right, but when he finds a ladder going up he will climb it. There is one man on the screen at a time, but the player is given three to start with. One bonus man is given at each 10,000 points, 10 points are scored per brick and 100 points per trapped monster. Bonus points are available running from 1,000 - 9,000 and are awarded for a varying number of monsters. The actual points are decreed by the level at which one is playing. The game starts on level one and progresses upon the collection of all of the bricks. The game has a certain number of tricks to it in the sense of the method of play, but broadly it is a skill game in the sense that one learns as one goes along. The monsters incidentally tend to gravitate to the man and are in no way set in their course, thus, when a monster reaches a ladder he may or may not use it. Just as Sea Wolf made a pleasant change from the space arcade games, so this one is also rather unique. Sound is available. The title is well chosen. One has to be very fast on one's feet to do well. The only question really is whether it is the player or the monsters that achieve the frenzied condition first.

WILLIAM — THE CONQUEROR VERSION

Mr. S. H. Ford is fast competing with the previously acknowledged master of the computer wargame, namely Dr. Bodley Scott. Mr. Ford has already written Napoleon and the Crusaders and now he brings to us William The Conqueror. It is our normal procedure to give the historical background to wargames in the catalogue, but even if it were not we would wish to give it on this occassion:

William was born in 1028, he was the illegitimate son of Duke Robert of Normandy. He was the only heir, and was known to his contemporaries as William the Bastard. When his father died in 1035 he became Duke of Normandy, at the tender age of seven.

In those early years his court was a nest of vipers; his guardians nearly all perished by murder or poisoning; he himself frequently had to be rushed from his home at night to be hidden from violence.

At the age of twenty he was threatened by the most serious rebellion of his life. A group of leading nobles gathered round William's cousin and rose in armed revolt. The young duke however was able to ask assistance from his nominal lord, the French king Henry I. At Val-es-Dunes near Caen the rebels were scattered. William had showed that he was a great military leader.

In 1053 a larger coalition of his foes tried again to crush him. By now King Henry had changed his attitude to William, he began to think of Normandy as a threat. In 1054 a French army marched into Normandy in a two-pronged attack, one force devastating along the Seine while the other struck into the Norman heartland. Hearing that the northern French army was feasting in the town of Mortemer, William fell on the French at dawn and completely surprised them. Panicked by the disaster, Henry withdrew.

In 1057 the last French effort to overcome William met with humiliating defeat at Varaville, where King Henry was forced to watch his advance guard being systematically destroyed by the Norman duke, who had cut it off on the west bank of the river Dives.

In 1066 Edward the Confessor died in England, and Harold crowned himself King of England. Over the Channel, William was now assembling a great fleet at Dives-sur-Mer. Later that year William's fleet set sail for England, he had with him 12,000 men in 600 ships. He landed at Pevensey, but found the area was not to his liking, and sailed along the coast to Hastings. There he built a camp and devastated the villages round about, and waited for Harold's arrival. On 14th October 1066 William met Harold at Hastings. William had 8,000 fighting men and Harold had ten thousand. William defeated Harold, but lost 2,000 men. He became known to history as William the Conqueror.

The game starts in 1047 and, of course, the user is playing the part of William, ruler of Normandy. The aim is to secure complete control of the Duchy and by the time of William's death in 1087 the user should hold not only all the lands that comprise Normandy, but must also acquire Maine, and Ponthieu and, of course, must regrettably, conquer England. This wargame is well up to Mr. Ford's normal standard and is supplied with map documentation.

ACM — AC CIRCUIT MODELLING PROGRAM

This program was featured in the August 1982 issue of Wireless World. From that comment alone the reader will appreciate that it is directed towards those customers who are interested, either as a hobby or as a professional, in the field of electronics. The program is written by R. Harcourt, a Chartered Electronics Engineer. As will be understood from the publication of its description in Wireless World it is an extremely important piece of software, the function of which is to plot frequency response graphs of gain and phase for both electric and electronic circuits. The circuits are input into the program using the values of Resistors, Capacitors, Inductors, Operational Amplifiers, Voltage and Current Sources.

ACM is indispensable for designing active filters, RF amplifiers, audio amplifiers and other electronic circuits. It will plot graphs using a normal printer which must be capable of 132 columns. Due to the fantastic amount of calculations that have to be carried out by the program it has been compiled and thus a typical 16 node active filter plot of 50 frequency points may be plotted in only 10 minutes on the Model I and III machines. On the Model II this is cut to 5 minutes.

The graphs plotted on the printer are log-log. If you specify the frequency range for the plot, ACM automatically scales X and Y axes to completely fill the page every time, and gives the logarithmic dB and frequency points on the axes. The phase shift is simultaneously plotted with the gain, using a linear phase axis.

The manual supplied with the software tells the user how to use ACM, of course, it also gives instructions as to how to model transistors using the Current Source element of ACM. As a matter of interest FETs and Valves can also be modelled in this way. Once a circuit is designed it can be saved to disk and of course loaded back into the computer at a later date. In this way a complete library of circuits can be held on the disk.

ACM brings to TRS80 owners who are also radio amateurs, electronic hobbyists or professionals, circuit design power previously only possible using mainframe computers.

DISKS

As still more and more different drive densities become available we have had to change our method of stocking disks.

We are now stocking four types as follows:

5" Standard 40 track single density	5" 80 track double density
5" 40 track double density	8" 80 track double density

You will note that there is no mention of disks to be used for double headed drives. The reason is that we have found the double density disks mentioned above acceptable in this application.

Our disks are guaranteed to the above specification only. Quite often lesser quality disks will accommodate the next grade up. In other words a 40 track single density standard disk will more often than not format to double density. A 40 track double density will quite often go to 80 track. None the less if your data is important then it is worthwhile going to the added expense for that particular disk even if you do not as a normal rule.

PAI – PRICE ADJUSTMENT INDICES

Although it is not generally known, we maintain a register at Molimerx of highly specialised programs, of which we gain knowledge. Normally they have been submitted to us for publication, but do not have sufficient general appeal to warrant inclusion in the catalogue. With regard to these programs we essentially act as a clearing house, bringing together enquiries for a specific type of program and the authors of such software. PAI may be considered to fall into this category in that it is specific to the Surveying and Building Contracting industries. It did seem to us, however, to be of such importance as a piece of software that we should publicise it in this catalogue. We are, therefore, stocking it in our normal way, but in fairness must make the point that it is a specialised type of program.
It is indispensable for both Quantity Sureveyors and Building Contractors, who operate as Main or General Contractors. In the building industry, indices are published monthly for labour and materials used in building contracts. First of all we should explain what the industry indices are. They indicate the relative level of increase or decrease at a specific date as compared with a date that has been taken as the standard. In some ways they can be likened to the Retail Price Index. These indices come in two forms, namely Firm indices and Provisional indices. The former are produced some two or three months after the month to which they apply and the latter are provisional for the interim period. PAI is a versatile program and makes provision for the entry not only of the Base index (entry at the start of the contract), but also monthly up-dates to both the Firm and Provisional indices as the contract progresses. There are forty-nine work categories which cover the entire spectrum of types of work within the building industry. PAI handles all forty-nine categories and in addition specialised engineering and labour only indices are supported. An additional feature of the program is that provision is made for retentions, materials and labour at the start of the contract.
From these indices the program calculates the fluctuations in Work Categories (which are user specified) throughout the life of the contract on a month by month basis and a hardcopy of the valuation is made. In this way the Contractor can at a glance determine the percentage increase/decrease in each of his work categories as the contract continues.
A valuation record is also available giving the net payment and also displays running totals of work valued and fluctuations thereon.

BOOKS

The books which we introduced some six months or so ago which are published by John Wiley and Son have proved to be very successful and as and when they publish new books that are relevant to the TRS80 we will be stocking them. Two new ones are available now as follows: –

FAST BASIC

In our estimation this is an excellent book. It is essentially divided into two. The first part, going up to page 105, contains a very lucid description of what the authors call Controlled Basic. The first 25 pages or so lead the reader through binary numbers and hexadecimal arithmetic. Although this may sound quite ordinary the authors go to quite a bit of trouble to relate everything they say to the TRS80. We personally find this rather refreshing. After this introduction Controlled Basic starts properly and what it really amounts to is a detailed description of many of the tricks and gimmicks which we have all got so fond of with the TRS80. A fairly full address table, for instance, is given which explains most of the locations in the communications area of the computer. Tips are given as to carrying out various short cuts, for instance, the method of changing program size reservation from within Basic and also the lesser known method of merging two Basic programs. A quite full description of the Control Blocks is given and a neat little modification to the TRACE command. Following on this are descriptions of the five Basic tables, namely the program itself, the Simple and the Array Variable Tables, the String Space and finally, of course, the Basic Stack. The final chapter in this section of the book is concerned with the various devices of the TRS80. There are not many users who will not benefit to some degree or other by reading this first half of the book. There are a number of books available now describing the ins and outs of Basic. Basic Faster and Better, for instance, is a prime example. But Fast Basic, or rather the first part of Fast Basic, seems to be very easily digestible.
The second part of the book is devoted entirely to the theory of Fast Basic. The idea is that if one combines machine code with Basic then one gets a faster program. This is, of course, stating the obvious, but there are a number of routines in this second half of the book which may be new to the average reader. Machine language or assembly code is to some extent explained. A useful appendix contains the Z-80 Instruction Set. Various ROM routines are described and particularly nice in this area is an appendix devoted to listing the Labels used in ROM. The Basic key word Jump Table is given, and indeed the book as a whole has something for everyone. It is written by two gentlemen, the first of whom George A. Gratzer is of the University of Manitoba in Winnipeg, Canada. The two books in the Mysteries series, Microsoft Basic Decoded and Basic Faster and Better are specialised works on their own particular subjects. If we had to summarise Fast Basic we would say that it contains a bit of both.

TRS80 COLOUR BASIC

This book is by Bob Albrecht, who has written a number of books on the TRS80, in particular he is co-author of TRS80 Basic. We have admired his previous books, but are not quite so enthusiastic about this one, not because of the contents, which leads one through TRS80 Colour Basic in Mr. Albrecht's inimitable style, explaining its subject in very easily digestible material and giving plenty of illustrations as it goes but because one wonders if it is necessary. It is written in what we always call a "folksy" manner, with plenty of illustrations of funny little men with balloons coming out of their heads. Whether one personally likes this or not it seems to be a method of producing a book which is very popular in our industry, so obviously it is successful. We do not, therefore, criticise it. Our criticism of the book is not of the book itself or of the authorship, but simply it seems to us to a large extent a duplication of the manual which one gets with the TRS80 Colour Computer. Without a doubt it has more illustrations, that is to say, programming illustrations, and these are explained more fully than in the manual. None the less, to a large extent it sets out to do what the manual does, namely to explain Colour Basic. Unlike some microcomputer manuals the Colour Basic one seems to us to be quite reasonable and one, therefore, wonders whether this book was really necessary. Having said that, we would reiterate that it does have more illustrations and explanations; so its application is for those who are having difficulty in assimilating the manual supplied.

UPDATES

HORACE

Horace is described elsewhere in the catalogue. In the new typeset version at page 93 and in the older catalogue on page 133. Horace is an extremely good Flat and National Hunt racing aid to betting. We have always wanted to be able to publish it on disk, but the original had to undergo a large number of changes before this could be done. We are happy to say that Mr. J. Norris, the author, has now provided us with a disk version, which in view of the length of the software is a much appeciated improvement.

SYSTEM DIAGNOSTIC

This program has been substantially updated. The Model III version now handles single and double density; 35, 40 or 80 track and double sided drives. Changes have been made in the RS-232 and Continuous tests. The Model I version now handles single and double density; 35, 40 or 80 track drives. The double density has provision for single or double density Bootstrap tracks. Again improvements have been made to the RS-232 and Continuous tests.

AJEDIT

A new version of this program is available and is described as a new program elsewhere in this list; customers are referred thereto. This improvement gives effect to some of the features of smal-LDOS and LDOS. For any customers using either of these two disk operating systems with AJEDIT at the moment it would most certainly be worth while to update. Customers using TRSDOS or NEWDOS + however, will not obtain any benefit and there would be no point in updating.

Hints and Tips — September 1982

You would be surprised at the amount of flak I get from customers for devoting too much time to tape owners and contrary wise to disk owners. This month, therefore, we will try and concentrate on one matter which applies to both and is, I always think, a rather glamorous tip! It is a method whereby a line can be hidden in the program so that when that program is listed a false line is shown. Many of you will already know how to do it. If so, my apologies for the dullness of this offering and you can turn to the program descriptions, for I will be discussing only this one subject. In fact, any of you who bought our very early programs — circa 1978/79 — may have come across the anomoly which I am going to describe, because at one time we did use it as a method of protecting our software. It does not in any way hinder the running or copying of a program. What it does do — if it is not spotted by the user — is to successfully prove beyond all doubt that the program emanated originally from a particular source. In other words, if somebody illegally copies a program, then if it contains this watermark the true owner can always prove that a copy which he comes across later is illegal. Somewhat like shutting the stable door after the horse has bolted, but in one Court case we used it successfully, so it is worth while.

As I have said the overall concept is that a line is inserted in the program which is over-written by a nonsensical line. It is this latter which appears on a VDU display. Unfortunately the anomoly shows up on a line print, but one cannot have everything. The best way of explaining how to do this is to actually carry it out on a computer. It does not matter whether it is a tape or a disk machine, nor whether it is Model I or Model III. It also works on the Video Genie and Genie I. I would suspect also on the Genie II, but I have never tried it. So switch on your machine and go into Basic. LOAD any program that you want, or if you prefer simply carry out the instructions from the keyboard. Which ever course you adopt we are interested in inserting a line, so for the sake of argument we will call it line 10, but of course it may be any number. If you are inserting into an existing program then, of course, make sure you are not over-writing an existing line number. Before you actually start typing you must decide on what watermark you want. It is best to use some sort of inscription for otherwise if one goes through Memory with a monitor then whatever the watermark is will quickly show up. We used to use the ASCII numbers representing the first four letters of my name. HARD in ASCII is 72 65 82 68. For the sake of this demonstration you might as well use the same, but you can use anything alse if you like. After you have typed the line number and space, type REM. This makes certain that the program will ignore the line, for you must remember that it is the line that we are now entering that will actually form part of the program, in other words if it were a valid command the program would recognise it and act upon it. So we typed REM and continue, with or without a space, to the ASCII representation mentioned above. Hit the Enter key and we will now have the following:

```
10 REM 72658268
```

This, therefore, is the watermark and we must cover it up. Type EDIT 10. As you know the line number will appear on the next line. From now on you must be a bit careful and before proceeding it would be wise to decide upon the contents of the masking line. I always used to look at the general context of the program to make sure that the line did not stand out. Try and avoid, for instance, the opening of a loop because you will not be closing it. Anyway this I must leave to you. For the purpose of this discussion we will assume that our mask is going to be IF X = 1 THEN 500. We left the procedure where we had the line number and the machine waiting for entry. Press the X key. This will take you to the end of the line, press the Shift key and the '. In other words we are making another REM statement. Keep your finger on the Shift button and using the left hand arrow, back space to the beginning of the watermark, that is to say, to the R. Note that the characters have not been erased as you back space, but now that you have got to the R it has disappeared. Release the Shift key and type in your masking line. As you do this the watermark line will disappear. When you have got to the last 0 of 500, press the Enter key and you are finished. To test it, do a list and you will see that the masking line IF X etc. is listed. THAT line has no relevance to the program whatever. It will have no affect. So far as the display is concerned the only way of finding the watermark is to edit that line again, so type EDIT 10 and just for fun hit the L key for List. You will see that you still have the masking line. Now, however, space through the line with the space bar and you will see the underlying watermark appear. And that is how it is done. A simple, easily installed, but no longer little known gimmick of the Microsoft interpreter. One final word. If you intend to use this gimmick seriously make the line as short as possible for in fact as it is listed it does display the watermark but this is so quickly over-written by the mask that you do not notice it. If you have a long watermark and, therefore, a long masking line there can be a slight imperceptible flicker to the knowledgeable it will be a dead give away.

INDEX and PRICE LIST

Program Name	Pge	M	Mem/lev	Price	Vat inc
555	127	D	16k/2	11.75	13.51
ACM *	141	AH	32k/db	35.00	40.25
Accounts 1.2 *	5	D	32k/db	39.00	44.85
Accounts Receivable	4	D	16k/2	18.50	21.28
Admiral Graf Spee	118	D	16k/2	11.75	13.51
Adventure (1 on tape)	14	D	16k/2	11.97	13.77
Adventure (3 on disk) *	14	A	32k/db	28.00	32.20
Adventure (3 on tapes)	14	D	16k/2	32.32	37.17
Adventure,Mysterious tape	Var	D	16k/2	8.75	10.06
Adventure,Mysterious disk *	Var	D	32k/db	11.75	13.51
Adventure,Mysterious 3/disk *	Var	D	32k/db	29.50	33.93
Adventure,Mysterious 2/disk *	Var	D	32k/db	20.00	23.00
Adventure original on disk*	25	A	32k/db	19.50	22.43
Adventures (1-9) Mod II *	54	B	64k	59.95	68.94
Adventure (S.A/Mys.) Tips	60/87			.50	.50
Ajedit *	99	D	32k/db	43.43	49.95
Ajedit on smal-LDOS *	140	D	32k/db	69.52	79.95
Alien Armada - tape	87	D	16k/2	8.75	10.06
Alien Armada - disk *	87	D	32k/db	11.50	13.23
Amateur Log *	110	D	32k/db	16.00	18.40
Amazin	6	D	4k/2	5.50	6.33
Android Nim	26	D	16k/2	8.75	10.06
Animation - tape	51	D	16k/2	14.95	17.19
Animation - disk *	51	D	32k/db	17.95	20.64
Assembly Package * **	25	A	32k/db	65.00	74.75
Asteroids - tape	77	D	16k/2	8.75	10.06
Asteroids - disk	77	D	32k/db	11.75	13.51
Astro Navigator	56	D	16k/2	13.00	14.95
Astroball - tape	92	D	16k/2	11.97	13.77
Astroball - disk *	92	D	32k/db	14.50	16.68
Astrolog	19	A	16k/2	9.50	10.93
Astronomical Calendar	89	D	16k/2	9.50	10.93
Autofile *	85	H	64k	28.00	32.20
Automap *	85	H	32k/db	39.00	44.85
Back-40 - tape	74	D	16k/2	8.75	10.06
Back-40 - disk *	74	A	32k/db	11.75	13.51
Bandito	59	A	16k/2	6.50	7.48
Bar Chase	16	D	16k/2	9.00	10.35
Basic 80 Interpreter CPM ***	OAP	B	64k	195.00	224.25
Basic Compiler-Accel	80	D	16k/2	19.95	22.94
Basic Compiler-Accel3 tape	80/121	D	16k/2	43.43	49.95
Basic Compiler-Accel3 disk*	"	D	32k/db	43.43	49.95
Basic Compiler-Accel4 disk*	134	D	32k/db	52.13	59.95
Basic Compiler * **	35	A	32k/db	115.00	132.25
Basic Compiler TRSDOS/CPM ***	84	B	64k	225.00	258.75
Basic Insert - disk *	108	D	32k/db	12.50	14.38
Basic Reference Mod II *	38	B	64k	50.00	57.50
Basketball - tape	56	D	16k/2	9.50	10.93
Basketball - disk *	56	D	32k/db	12.50	14.38
Battle of Britain	18	D	16k/2	13.50	15.53
Beewary	26	D	16k/2	8.75	10.06
Binary/hex/oct/dec converter	5	D	16k/2	7.35	8.45
Binder for List or Disks **				1.55	1.78
Biorhythm	7	D	16k/2	7.50	8.63
Blackboard	83	D	16k/2	8.75	10.06
Blackjack Master - tape	97	D	16k/2	18.40	21.16
Blackjack Master - disk *	97	A	32k/db	22.10	25.42
Blink - Model I *	55	A	32k/db	14.80	17.02
Blink - Model II *	55	B	64k	29.00	33.35
Blockade	58	A	16k/2	6.50	7.48
Books - Lbasic	122			5.95	5.95
Books - Basic Faster & Better	98			19.90	19.90
Books - Disk Mysteries	34			15.52	15.52
Books - Basic Decoded	55			19.90	19.90
Books - Custom TRS-80	98			19.90	19.90
Books - Video Genie	60			5.00	5.00
Books - Model III ROM	82			16.85	16.85
Books - Level II Basic	111			5.95	5.95
Books - More TRS-80 Basic	111			6.75	6.75
Books - My Micro Speaks Basex	111			7.75	7.75
Books - TRS-80 Means Business	112			8.95	8.95
Books - Problems/Pocket Comp	112			5.95	5.95
Books - Succ.S/ware Small Cpr	112			5.95	5.95
Books - Using CP/M	112			7.50	7.50
Books - Programs/Beginners	112			7.00	7.00
Books - Data File Programming	112			6.75	6.75
Books - Fast Basic	142			10.00	10.00
Books - TRS-80 Colour Basic	142			6.75	6.75
Bprint *	86	B	32k/db	25.00	28.75
Bright & Early	117	D	16k/2	7.75	8.91
Buzzword	4	D	16k/2	5.00	5.75
Calendar	7	D	16k/2	8.95	10.29
Cash Register	5	D	16k/2	8.95	10.29
Cassettes - blank C12 (10)	10			4.75	5.46
Cassettes - labels (20)	10			.95	1.09
Checker King	50	A	16k/2	14.00	16.10
Cheque Book	33	D	16k/2	13.50	15.53
Chemical Formulae	111	D	16k/2	9.50	10.93
City Encounters	109	D	16k/2	14.95	17.19
Code Breaker	59	A	16k/2	6.50	7.48
Colour Zap *	133	I	E/B	29.00	33.35
Company Director	37	D	16k/2	14.95	17.19
Comproc	5	A	16k/db	13.75	15.81
Comput-A-Organ	17	D	16k/2	5.95	6.84
Computer Pools	108	D	16k/2	14.50	16.68
Constellation - tape	110	A	16k/2	12.50	14.38
Constellation - disk *	110	A	32k/db	15.50	17.83
Conv/CPM *	120	D	32k/db	18.00	20.70

Program Name	Pge	M	Mem/lev	Price	Vat inc
Convert *	86	B	64k	25.00	28.75
Copl6K	93	A	16k/2	11.25	12.94
Copsys	7	D	16k/2	11.25	12.94
CP/M 2 - Mod II * **	61	B	64k	154.00	177.10
Creole Lobstercatcher	59	D	16k/2	8.75	10.06
Cribbage	53	D	16k/2	12.50	14.38
Cross Reference	3	D	16k/2	7.35	8.45
Crusaders	128	D	16k/2	11.75	13.51
Cube Hunt	50	A	16k/2	9.00	10.35
Dark Void	42	D	16k/2	8.75	10.06
Darts	111	D	16k/2	8.75	10.06
Data Base Management CCA	51	A	32k/db	75.00	86.25
Data Base Management - tape	20	A	16k/2	25.00	28.75
Data Base Management - disk *	20	A	32k/db	28.00	32.20
Data Separator	74			20.00	23.00
Data Writer * **	135	D	48k/db	78.00	89.70
Day of the Week	4	D	4k/1,2	5.00	5.75
Defend - tape	105	D	16k/2	13.00	14.95
Defend - disk *	105	D	32k/db	16.00	18.40
Descriptive Statistics	81	D	16k/2	13.40	15.41
Differential Equations	94	D	16k/2	14.00	16.10
Direction Finder	26	D	16k/2	13.40	15.41
Disassembler	7	D	16k/2	9.00	10.35
Discator *	120	D	32k/db	26.00	29.90
Diskaid *	40	A	32k/db	16.95	19.49
Disk Binder **	55			17.50	20.13
Disk Directory *	39/120	D	32k/db	17.50	20.13
Disk sleeves (cardboard) - 10	49			1.00	1.15
Disk sleeves (plastic) - 5	16			2.65	3.05
Disk sleeves,5 with binder **	16			4.50	5.23
Disks - regular,each	10			2.60	2.99
Disks - regular,10 (f/sleeves)	10			22 00	25.30
Disks - 40 track DD each	141			2.90	3.34
Disks - ditto x 10 f/sleeves	141			27.50	31.63
Disks - 80 track DD each	141			4.20	4.83
Disks - ditto x 10 f/sleeves	141			39.00	44.85
Disks - 8" Mod II - 10 **	10			26.04	29.95
Dominoes - tape	10	A	16k/2	7.95	9.14
Dominoes - disk *	10	A	32k/db	11.00	12.65
Dosfix	44	B	64k		Free
Dosort	9	A	32k/db	24.00	27.60
Double Take 3741 *	87	B	64k	39.00	44.85
Doubler - Aerocomp	106			98.00	112.70
Draughts - tape	35	D	16k/2	13.00	14.95
Draughts - disk *	35	D	32k/db	16.00	18.40
Draw & Graphics Resolver	19	A	16k/2	9.50	10.93
Dreamworld	87	D	16k/2	8.75	10.06
Driver	4	D	4k/2	5.50	6.33
DSM *	29	A	32k/db	40.00	46.00
DSM *	29	B	64k	80.00	92.00
DSM *	29	C	32k/db	50.00	57.50
Duel-n-Droids - tape	21	D	16k/2	9.50	10.93
Duel-n-Droids - disk *	21	D	32k/db	12.50	14.38
Duel in the Dark	110	D	16k/2	9.50	10.93
Edas *	90	D	32k/db	46.50	53.48
Edit	103	D	16k/2	17.50	20.13
Editor Assembler Plus	24	A	16k/2	21.70	24.95
Edjust *	103	A	32k/db	16.00	18.40
Electric Accountant *	73	D	48k/db	25.00	28.75
Elemental Maze	82	D	16k/2	9.50	10.93
Emperor	28	D	16k/2	13.50	15.53
Engine Driver	133	D	16k/2	8.75	10.06
Enhanced Basic - tape	22	A	16k/2	24.00	27.60
Enhanced Basic - disk *	22	A	32k/db	27.00	31.05
Epson Patch - tape	107	A	16k/2	12.00	13.80
Epson Patch - disk *	107	A	32k/db	15.00	17.25
Everest Explorer - tape	74	D	16k/2	8.75	10.06
Everest Explorer - disk *	74	D	32k/db	11.75	13.51
Extended Basic *	47	B	64k	100.00	115.00
Extended Basic *	47	C	32k/db	62.50	71.88
Extended Built Functions *	85	B	64k	50.00	57.50
Extended Blt/Fnctns *	85/104	C	32k/db	37.50	43.13
Fairytale Adventure	72	D	16k/2	8.75	10.06
Family Tree tape	120	D	16k/2	15.00	17.25
Family Tree disk *	120	D	32k/db	18.00	20.70
Farmer Brown	42	A	16k/2	6.50	7.48
FastBack *	127	B	32k/db	44.50	51.18
Fed *	107	D	32k/db	24.00	27.60
Fetch *	104	A	32k/db	13.50	15.53
Filter Package *	119	D	32k/db	35.00	40.25
File Handling for Disk *	3	D	32k/db	25.00	28.75
File Handling for Tape	5	D	16k/2	13.85	15.93
Financial Analysis *	29	D	32k/db	40.00	46.00
Flight Plan tape	117	D	16k/2	15.00	17.25
Flight Plan disk *	117	D	32k/db	18.00	20.70
Forest of Mordor	82	D	16k/2	7.50	8.63
Fortran * **	26	A	32k/db	65.00	74.75
Fox and Hounds	50	D	16k/2	6.50	7.48
French Vocabulary	89	D	16k/2	14.95	17.19
Frenzy	141	D	16k/2	8.50	9.78
Friend (1.2 TRSDOS only) *	48	B	64k	37.50	43.13
Frog	52	A	16k/2	6.50	7.48
Frog II	133	D	16k/2	8.50	9.78
Galactic Empire	18	D	16k/2	8.50	9.78
Galactic Revolution	37	D	16k/2	8.50	9.78
Galactic Trader	28	D	16k/2	8.50	9.78
Gammon Challenger - tape	75	D	16k/2	8.75	10.06
Gammon Challenger - disk *	75	D	32k/db	11.75	13.51

Program Name	Pge	M	Mem/lev	Price	Vat inc
Garbage Collection *	104	B	64k/db	50.00	57.50
Garbage Collection *	104	C	32k/db	37.50	43.13
Gencop	79	A	16k/2	8.75	10.06
Golf *	45	D	32k/db	14.95	17.19
Gomoko	35	D	16k/2	9.85	11.33
Graph Plotter - tape	15	D	16k/2	14.95	17.19
Graph Plotter - disk *	15	D	32k/db	18.00	20.70
Graphit *	126	D	48k/db	17.00	19.55
Green Screen Mod I,II,III	22			8.00	9.20
GSF	9	D	16k/2	17.50	20.13
GSF *	32	B	64k	26.00	29.90
Guessword & Worm	122	D	16k/2	8.75	10.06
Hamurabi	10	D	16k/2	6.50	7.48
Hannibal	42	D	16k/2	13.50	15.53
HazelHost *	86	B	64k	40.00	46.00
Help *	135	D	32k/db	19.50	22.43
Hexspell 2 * (Ldos M.III)	97	D	32k/db	52.00	59.80
Honest Joe	92	D	16k/2	9.50	10.93
Horace	93	D	16k/2	14.00	16.10
Horolog - tape	79	D	16k/2	14.00	16.10
Horolog - disk *	79	D	32k/db	17.00	19.55
Host/Terminal *	48	B	64k	25.00	28.75
Imon	36	A	16k/2	23.10	26.57
Impakt - tape	70	D	16k/2	28.00	32.20
Impakt - disk *	70	D	32k/db	28.00	32.20
Impakt 1 - tape	70	D	16k/2	14.00	16.10
Impakt 2 - tape	70	D	16k/2	14.00	16.10
Incomplete Records *	43	D	48k/db	150.00	172.50
Index	17	D	16k/2	14.95	17.19
Infinite Basic	14	A	16k/2	25.95	29.84
Infinite Basic	14	C	16k/2	29.00	33.35
Infinite Business	14	D	16k/2	17.95	20.64
Instant Sort/Search-tape	56	D	16k/2	24.50	28.18
Instant Sort/Search-disk*	56	D	32k/db	27.50	31.62
Interactive Fiction: *					
Six Micro Stories	50	A	32k/db	12.50	14.38
Any other Story	50	A	32k/db	14.50	16.68
Invaders - tape	17	D	16k/2	13.00	14.95
Invaders - disk *	17	D	32k/db	16.00	18.40
Invoice *	5	D	16k/db	25.00	28.75
Jumbo tape	125	D	16k/2	15.00	17.25
Jumbo disk *	125	D	32k/db	17.00	19.55
Junior Utility - tape	58	D	16k/2	9.50	10.93
Junior Utility - disk	58/117	D	32k/db	12.00	13.80
Keyboard Bounce Fix	8	A	4k/2	5.00	5.75
Keyboard Mask - tape	91	D	16k/2	9.50	10.93
Keyboard Mask - disk *	91	D	32k/db	12.50	14.38
KFS-80 *	81	A	32k/db	48.00	55.20
KFS-80 *	81	B	64k	85.00	97.75
King Arthur	79	D	16k/2	9.50	10.93
Knight - de Luxe *	103	A	32k/d	11.75	13.51
Knights Tour	43	D	16k/2	6.50	7.48
Kubik	90	D	16k/2	6.50	7.48
Label Maker *	132	D	32k/db	16.00	18.40
Labeller *	93	A	32k/db	17.95	20.64
Labyrynth	26	D	16k/2	9.50	10.93
Lbasic (book)	122			5.95	5.95
LDOS * **	63-70/123	D	32k/db	85.00	97.75
LED *	128	D	48k/db	17.00	19.55
Level I in Level II	6	A	16k/2	9.85	11.33
Level III	4	A	16k/2	29.95	34.44
Lifetwo	34	D	16k/2	9.75	10.06
Light Pen	27	D		14.00	16.10
Linear Regression	14	D	4k/2	5.95	6.84
Loan	3	D	4k/2	7.35	8.45
Lost Colony - tape	107	D	16k/2	11.97	13.77
Lost Colony - disk *	107	D	32k/db	14.50	16.68
Lunar Lander	6	D	16k/2	5.00	5.75
Lunar Lander (new) - tape	80	D	16k/2	8.75	10.06
Lunar Lander (new) - disk *	80	D	32k/db	11.75	13.51
Maces and Magic,Balrog *	83	A	32k/db	20.00	23.00
Machine Code to Basic	44	A	16k/2	9.95	11.14
Mailing List (new) *	15	D	32k/db	29.00	33.35
Mailing List (new) *	15/31	B	64k	45.00	51.75
Mailit *	110	D	32k/db	29.00	33.35
Marquee	121	D	16k/2	11.75	13.51
Master/Slave *	46	B	64k	72.50	83.38
Maths Speed Test	108	D	16k/2	8.75	10.06
Matrix Manipulator	14	D	16k/2	28.00	32.20
Maxi Manager-see Data Writer	135				
Medieval Magic - tape	119	D	16k/2	7.95	9.14
Medieval Magic - diskt *	119	D	32k/db	10.95	12.59
Memdisk *	115	D	32k/db	24.95	28.69
Miles per Gallon *	108	D	32k/db	16.00	18.40
Minefield	19	D	16k/2	6.50	7.48
Mini Utility	103	D	16k/2	6.50	7.48
Mini Utility No.2	121	D	16k/2	6.50	7.48
Monitor *	119	D	32k/db	17.95	20.64
Monitor 3	3	D	16k/2	23.10	26.57
Monitor 4 - tape	3	D	16k/2	28.10	32.32
Monitor 4 - disk *	3	D	32k/db	30.00	34.50
Money Manager *	117	D	32k/db	21.00	24.15
Morse Code	25	A	16k/2	9.50	10.93
Morse Code Comm. - tape	35	A	16k/2	14.95	17.19
Morse Code Comm. - disk *	35	A	32k/db	17.95	20.64
Multiple Choice Questions *	75	D	32k/db	19.00	21.85
MuMath *	35	A	32k/db	42.50	48.89
Music Master - tape	33	D	16k/2	14.95	17.19
Music Master - disk *	33	D	32k/db	17.95	20.64

Program Name	Pge	M	Mem/lev	Price	Vat inc
Mysterious Adv. - tape	Var	D	16k/2	8.75	10.06
Mysterious Adv. - disk *	Var	D	32k/db	11.75	13.51
Mysterious Advntre Advice	Sht 87			.50	.50
Napoleon	97	D	16k/2	11.75	13.51
Newdos + (35,40,77 Track) *	8	A	32k/db	49.00	56.35
Nominal Ledger * **	11	A	32k/db	140.00	161.00
Nominal Ledger * **	11	B	64k	300.00	345.00
Nominal Ledger * **	11	C	32k/db	170.00	195.50
Noughts & Crosses	9	D	4k/1,2	7.35	8.45
Nuclear War	46	D	16k/2	9.50	10.93
Numb	59	A	16k/2	9.50	10.93
Object Code Relocator	7	D	16k/2	9.25	10.63
Olympic Decathlon - tape	54	A	16k/2	16.50	18.98
Olympic Decathlon - disk	54	A	32k/db	19.50	22.43
I to II *	86	B	64k	15.00	17.25
Opera Theatre	58	A	16k/2	9.50	10.93
Othello (see Gomoko)					
Owl Tree	34	A	16k/2	8.75	10.06
PAI *	142	D	48k/db	55.00	63.25
PDS *	120	D	48k/db	24.95	28.69
Pack/Unpack *	14	A	32k/db	29.10	33.47
Page File *	116	D	32k/db	19.50	22.43
Paraform	128	D	32k/db	16.50	18.98
Pascal *	53/122	D	48k/db	70.00	80.50
Payroll - disk *	11	A	32k/db	140.00	161.00
Payroll - disk *	11	B	32k/db	300.00	345.00
Payroll - disk *	11	C	32k/db	170.00	195.50
Pelmanism	76	D	16k/2	9.00	10.35
Pencil Patch	99	C	32k/db	14.00	16.10
Penetrator - tape	131	D	16k/2	13.00	14.95
Penetrator - disk *	131	D	32k/db	16.00	18.40
Pigskin - tape	74	D	16k/2	9.50	12.50
Pigskin - disk *	74	D	32k/db	12.50	14.38
Pilot	76	A	16k/2	12.00	13.80
Pinball - tape	33	D	16k/2	13.00	14.95
Pinball - disk *	33	A	32k/db	16.00	18.40
PL/B *	84	B	64k	100.00	115.00
Poker	83	D	16k/2	8.75	10.06
Pools	36	D	16k/2	13.50	15.53
Prime Numbers	4	D	16k/2	7.35	8.45
Probe *	60	D	32k/db	16.95	19.49
Prodata *	15	D	32k/db	38.50	44.28
Project Omega - tape	73	D	16k/2	8.75	10.06
Project Omega - disk *	73	D	32k/db	11.75	13.51
Protext *	24	A	32k/db	38.50	44.28
Prozap *	40	D	32k/db	19.95	22.94
Purchase Ledger *	11	A	32k/db	140.00	161.00
Purchase Ledger *	11	B	64k/db	300.00	345.00
Purchase Ledger *	11	C	32k/db	170.00	195.50
Purchase Ledger - tape	24	D	16k/2	19.00	21.85
QRA Locator	44	D	16k/2	8.75	10.06
Quad - tape	56	D	16k/2	9.50	10.93
Quad - disk *	56	D	32k/db	12.50	14.38
Quagmire	79	D	16k/2	8.75	10.06
Quick-Pro Plus * **	139	D	48k/db	98.00	112.70
Quick-Pro Plus * **	139	B	64k	108.00	124.20
Race - tape	15	D	16k/2	8.50	9.78
Race - disk *	15	D	32k/db	11.50	13.23
Racing Driver	105	I	16k/ec	8.75	10.06
Random Dungeon Generator	80	D	16k/2	14.95	17.19
Regress *	30	D	32k/db	15.75	18.11
Remodel/Proload	9	D	16k/2	24.00	27.60
Renumber Basic	9	A	16k/2	9.85	11.33
Roulette	133	D	16k/2	8.50	9.78
Sales Ledger *	11	A	32k/db	140.00	161.00
Sales Ledger *	11	B	64k	300.00	345.00
Sales Ledger *	11	C	32k/db	170.00	195.50
Sales Ledger 1 *	118	A	48k/db	150.00	172.50
Sales Ledger 1 *	118	C	48k/db	180.00	207.00
Sbasic *	84	A	32k/db	22.50	25.88
Sam Loyd	89	D	16k/2	8.50	9.78
Sargon II - tape	10	D	16k/2	22.10	25.42
Sargon II - disk *	10	A	32k/db	25.75	29.61
Sauce *	94	B	64k/db	25.00	28.75
Sauce for CP/M *	94/120	B	64k/db	25.00	28.75
Scripsit - tape **	30	A	16k/2	39.09	44.95
Scripsit - disk * **	30	A	32k/db	60.83	69.95
Scripsit * **	30	B	64k	156.48	179.95
Scripsit * ** (Ver 2.0)	30	B	64k	216.52	249.00
SECS	116	I	16k/2	22.00	25.30
Sea Wolf tape	126	D	16k/2	8.75	10.06
Sea Wolf disk *	126	D	32k/db	11.00	12.65
Serpent - tape	81	D	16k/2	8.75	10.06
Serpent - disk *	81	D	32k/db	11.75	13.51
Share Analysis *	75	D	32k/db	19.00	21.85
Share Dividends - tape	20	A	16k/2	14.95	17.19
Share Portfolio - tape	7	A	16k/2	24.95	28.69
Share Portfolio *	75	D	32k/db	19.00	21.85
Shark Attack	27	A	16k/2	5.50	6.33
Sheepdog	88	D	16k/2	7.65	8.80
Showdown - tape	83	D	16k/2	8.75	10.06
Showdown - disk *	83	D	32k/db	11.75	13.51
Shuttle II - tape	78/107	D	16k/2	14.00	16.10
Shuttle II - disk *	78/107	D	32k/db	16.80	19.32
Sigmon	116	I	16k/2	22.00	25.30
Slot Machine	10	D	16k/2	7.65	8.80
smal-LDOS	127	D	16k/DB	38.00	43.70
Smart Terminal - tape	25	D	16k/2	22.00	25.30
Smart Terminal - disk *	25	D	32k/db	24.50	28.18

Program Name	Pge	M	Mem/lev	Price	Vat Inc
Sole	121	A	32k/db	17.50	20.12
Sort	3	D	16k/2	5.50	6.32
Sound - tape	33	A	16k/2	8.50	9.78
Sound - disk *	33	A	16k/db	11.50	13.23
Space Eye - tape	76	D	16k/2	8.75	10.06
Space Eye - disk *	76	D	32k/db	11.75	13.51
Space Fighter	10	D	16k/2	5.85	6.73
Space Fighter Colour (Genie)	10	G	16k/2	5.85	6.73
Space Fighter Colour (TRS-80)	105	I	16k/ec	8.75	10.06
Space Rocks - tape	88	D	16k/2	11.97	13.77
Space Rocks - disk	88	D	32k/db	14.50	16.68
Speedy	91	A	16k/2	7.65	8.80
Spooler (memory) par/ser *	46	B	32k	54.50	62.68
Spooler (disk) par/ser *	46	B	32k	54.50	62.68
Spooler * par	44	F	16k/db	50.00	57.50
Spooler * par	44	C	32k/db	50.00	57.50
Star Fire	52	D	16k/2	5.50	6.33
Starfighter - tape	88	D	16k/2	14.00	16.10
Starfighter - disk	88	D	32k/db	16.50	18.98
Star Trek (new)	4	D	16k/2	9.50	10.93
Stock 80 *	44	A	32k/db	150.00	172.50
Stock Control - tape	24	D	16k/2	17.00	19.55
Stock Control *	24	D	32k/db	20.00	23.00
Stock Control *	11	A	32k/db	140.00	161.00
Stock Control *	11	B	64k	300.00	345.00
Stock Control *	11	C	32k/db	170.00	195.50
Stock Market Game	15	D	16k/2	9.50	10.93
Strike Force - tape	131	D	16k/2	13.00	14.95
Strike Force - disk *	131	D	32k/db	16.00	18.40
Struc.Basic Translator *	28/115	D	32k/db	24.00	27.60
Submarine Chase	10	D	4k/1,2	5.50	6.32
Supa-Trek	17	A	32k/2	14.95	17.19
SuperCalc * **	110	B	64k	170.00	195.50
Superlife	43	D	16k/2	9.50	10.93
SuperScript *	58	D	32k/db	25.00	28.75
Super Utility + (2 disks)*	60	D	32k/db	40.00	46.00
Suppressor Dist.Unit **	130			28.00	32.20
Sysdump	29	A	16k/2	8.25	9.49
System Diagnostic - tape	95	D	16k/2	34.74	39.95
System Diagnostic - disk *	95	D	32k/db	36.91	42.45
System Savers	29	D	16k/2	11.25	12.94
Tables	42	D	16k/2	6.50	7.48
Tarot	76	D	16k/2	9.50	10.93
Telehost *	86	B	64k	40.00	46.00
Telephone Index *	29	D	32k/db	19.00	21.85
Tenpin - tape	88	D	16k/2	9.50	10.93
Tenpin - disk *	88	D	32k/db	12.50	14.38

Program Name	Pge	M	Mem/lev	Price	Vat Inc
Terminal Patches *	49	B	32k	65.00	74.75
Texpro	91	D	16k/2	18.00	20.70
Ting Tong	59	A	16k/2	6.50	7.48
Touch Typing Course:					
- First lesson	42	A	16k/2	10.00	11.50
- Subsequent lessons	42	A	16k/2	6.50	7.48
- Entire Course **	42	A	16k/2	45.00	51.75
- Entire Course - disk *	42	A	32k/db	47.50	54.63
Tracker *	45	A	32k/db	22.50	25.88
Treasure Trove - tape	81	D	16k/2	8.75	10.06
Treasure Trove - disk *	81	D	48k/db	11.75	13.51
Treasure Quest	51	D	16k/2	8.50	9.78
Triumph of Rome	109	D	16k/2	11.75	13.51
Tsave	80	A	16k/2	4.95	5.69
Tunnels of Fahad	54	D	16k/2	6.50	7.48
Typing Tutor	28	A	16k/2	11.50	13.23
Underworld	138	D	16k/2	8.50	9.78
Ultrappd	86	B	64k	49.00	56.35
Utilities Package 1 *	31	B	64k	70.00	80.50
Utilities Package 2 *	31	B	64k	70.00	80.50
Utilities Package 3 *	31	B	64k	60.00	69.00
VAT Register (including D)	17	D	16k/2	20.00	23.00
Visicalc * **	59	A	32k/db	60.83	69.95
Visicalc * **	59	B	64k	129.56	149.00
Visicalc * ** (enhanced)	59	C	32k/db	104.30	119.95
Vision Load	22	D	16k/2	11.50	13.23
William the Conqueror	141	D	16k/2	11.75	13.51
Wonderland Adventure	83	D	16k/2	8.75	10.06
Word Wars	70	A	16k/2	7.35	8.45
Wumpus	3	D	16k/2	5.50	6.32
Xprint *	99	B	64K	17.50	20.13
Xscreen *	86	B	64k	15.00	17.25
Yi-Ching	52	D	16k/2	9.50	10.93
Z-Chess III	26	D	16k/2	14.50	16.68
Z-Chess III *	26	D	32k/db	17.50	20.13
Zossed in Space	50	D	16k/2	8.75	10.06

Machine Type Codes

A = Model I TRS-80,I & II Genie
B = Model II TRS-80 only
C = Model III TRS-80 only
D = Models I & III TRS-80,Models I & II Genie
E = Genie I & II only
F = Model I TRS-80 not Genie
G = Colour Genie
H = Model II & III TRS-80
I = TRS-80 Colour

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